TransWest Express Transmission Project

Draft

Environmental Impact Statement

(Volume I)

BLM

Wyoming State Office

June 2013

Western AREA POWER ADMINISTRATION

Mission Statement

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

Mission Statement

Western is a Federal agency under the Department of Energy that markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states. Western's mission: Market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services.

BLM/WY/PL-13/021+5101

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office

and

United States Department of Energy

WESTERN AREA POWER ADMINISTRATION

In Reply Refer To:
WYW–177893
COC–72929
UTU–87238
NVN–86732
DOE/EIS-0450

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Impact Statement (EIS) for the proposed TransWest Express Transmission Project (Project) and accompanying land use plan amendments for affected Bureau of Land Management (BLM) areas and National Forest units. TransWest Express LLC (Applicant) submitted applications for right-of-way (ROW) grants and special use permits to use portions of the National System of Public Lands in southern Wyoming, northwestern Colorado, across Utah, and into southern Nevada. The Applicant also has submitted a statement of interest and entered into a pre-development agreement with the Western Area Power Administration (Western) to potentially obtain financing for the Project from the borrowing authority granted to Western under the American Recovery and Reinvestment Act of 2009 (Recovery Act) (Public Law 111-5). The Applicant-proposed transmission line route and route alternatives cross public lands administered by 14 BLM Field Offices and five national forests over four states. The BLM Wyoming State Office and Western have been designated as joint lead Federal agencies for the National Environmental Policy Act of 1969 (NEPA) process, and are mutually overseeing the preparation of the EIS.

This Draft EIS was prepared in consultation with over 50 cooperating agencies and in accordance with the NEPA, as amended; and Council on Environmental Quality, Department of the Interior, Department of Energy, and Department of Agriculture regulations for implementing NEPA outlined in 40 Code of Federal Regulations (CFR) Parts 1500-1508, 43 CFR Part 46, 10 CFR 1021, and 36 CFR 220, respectively. Accompanying land use plan amendments were prepared for areas not consistent with the administering agency plan pursuant to the Federal Land Policy and Management Act of 1976, the National Forest Management Act of 1976, and the BLM and United States (U.S.) Forest Service (USFS) land use planning regulations at 43 CFR 1610.5 and 36 CFR 219.10.

The Draft EIS analyzes the consequences of the agencies' decisions on granting a BLM ROW and USFS special use permits to construct and operate a high voltage, direct current (DC) transmission system. Western and the Applicant are engaged in pre-development activities that precede Western's and the Department of Energy's decision whether to provide funding for a Recovery Act project. The Draft EIS also informs Western's decision on whether to use its borrowing authority to partially finance and hold partial ownership with TransWest in the resulting transmission facilities and capacity. The Project would provide the transmission infrastructure and capacity to deliver approximately 3,000 megawatts of electric power from renewable and other energy sources in south-central Wyoming to a substation hub in southern Nevada. The Applicant-proposed project would consist of an approximately 725-mile-long

600-kilovolt, high voltage DC transmission line and two terminals, each containing an alternating current/direct current (AC/DC) converter station. The northern AC/DC converter station would be located near Sinclair, Wyoming, and the southern AC/DC converter station would be located near the Marketplace Hub – a group of substations approximately 25 miles south of Las Vegas, Nevada. A ground electrode system (required for transmission line emergency shutdown) would be installed within 100 miles of each terminal. The Project would retain an option for future interconnection with the Intermountain Power Project transmission system in Millard County, Utah.

Alternatives to the proposed project were developed in response to issues raised during the NEPA scoping period. The Project has been divided geographically into four regions for analysis based on common locations where project alternative routes converge and can be combined with other alternative routes in the region. Each region contains an Applicant-proposed route and two to five alternative routes that are analyzed in this EIS, as well as the No Action Alternative. The BLM, through consultation with other Federal, State, and local cooperating agencies, has identified an agency preferred alternative within each of the four Project regions that would all combine to create a continuous route from Wyoming to Nevada, totaling approximately 760 miles. The BLM and USFS have identified plan amendments for each of the land use plans that would require modifications if the proposed or an alternative route is selected.

The Draft EIS and accompanying plan amendments are not decision documents. Their purpose is to inform the public and interested parties of the relative impacts of the proposed action and alternatives, and to solicit comments from other agencies and the public. The Draft EIS also provides information to other regulatory agencies for use in their decision-making process for permits required to proceed with the Project.

The BLM and Western will host public meetings to discuss the Draft EIS. Dates, times, and locations of these meetings will be distributed in newsletters, announced in the local news media, and posted on the Project website at http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/transwest.html.

The BLM and Western invite public comment on the Draft EIS, the Agency Preferred Alternative, and accompanying plan amendments. Your review and comment on the content of this document are critical to the project analysis and associated plan amendments. Comments should be as specific as possible. Please include suggested changes and sources or methodologies if applicable, and references to relevant section, page, and volume numbers of the document. Responses to substantive comments (further defined in 40 CFR 1503.3 and in Section 6.9.2.1 of BLM Handbook H-1790-1) will be included in the Final EIS.

The publication of the Notice of Availability in the *Federal Register* by the U.S. Environmental Protection Agency begins the 90-day comment period. Written comments will be accepted by fax, email, or letter. Please refer to "TransWest Transmission Project Comments" in your correspondence. Please provide your comments to:

Bureau of Land Management, Wyoming State Office
Attn: Sharon Knowlton, TWE Project Manager
P.O. Box 20678
Cheyenne, Wyoming 82003
E-mail: TransWest_WYMail@blm.gov
(307) 775-6124
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The Draft EIS is available for review during normal business hours at the following locations or at the following website: http://www.blm.gov/wy/st/en/info/NEPA/document/hdd/transwest.html:

BLM Wyoming State Office
BLM Rawlins Field Office
BLM Rock Springs Field Office
BLM Little Snake Field Office
BLM White River Field Office
BLM Grand Junction Office
BLM Cedar City Field Office
BLM Fillmore Field Office
BLM Moab Field Office
BLM Price Field Office
BLM Richfield Field Office
BLM St. George Field Office
BLM Vernal Field Office
BLM Egan Field Office
BLM Caliente Field Office
BLM Las Vegas Field Office
USFS Dixie National Forest

Before including your address, phone number, email address, or other personal identifying information in your comment, be aware that your entire comment – including your personal identifying information – may be made publicly available. While you may ask us to withhold your personal identifying information from public release, we cannot guarantee that we will be able to do so. BLM and Western will not consider anonymous comments. Comments, including names and street addresses of respondents (unless otherwise withheld), will be available for public review at the BLM Wyoming State Office from 7:45 a.m. to 4:30 p.m. Monday through Friday, excluding federal holidays. Comments may be published as part of the NEPA document and other related documents. All submissions from organizations or businesses will be made available for public inspection in their entirety.

Thank you for your interest and participation in this NEPA process.

Sincerely,

Donald A. Simpson
State Director, BLM Wyoming

Mark A. Gabriel
Administrator, Western Area Power Administration

Enclosures – As Stated

Executive Summary

This Executive Summary is intended to provide a brief overview of the proposed Project, alternatives, and conclusions from the impact analyses. For the supporting documentation and detailed analyses please see the full environmental impact statement (EIS).

ES.1 Project Overview

The TransWest Express Transmission Project (Project) is proposed as an extra high voltage, direct current (DC) transmission system extending from south-central Wyoming to southern Nevada (**Figure ES-1**). The proposed transmission line (and alternatives) cross four states (Wyoming, Colorado, Utah, and Nevada) encompassing lands owned or administered by the Bureau of Land Management (BLM), United States (U.S.) Forest Service (USFS), National Park Service (NPS), Bureau of Reclamation, Utah Reclamation Mitigation and Conservation Commission, various state agencies, Native American tribes, municipalities, and private parties. The Project would provide the transmission infrastructure and capacity necessary to deliver approximately 3,000 megawatts (MW) of electric power from renewable and/or other non-renewable energy resources in south-central Wyoming to southern Nevada. One MW (or 1 million watts) of power can deliver approximately 6.5 million kilowatt-hours (kWh) of electricity in 1 year. An average U.S. household consumes about 10,655 kWh of electricity in a year. Therefore, 1 MW of power provides electricity for 610 households' annual use (American Wind Energy Association 2008). The Project would transmit power for over 1,800,000 households annually.

In April 2010, TransWest Express LLC (TransWest/Applicant) and Western Area Power Administration (Western), an agency of the U.S. Department of Energy, entered into a Memorandum of Understanding (MOU) in which Western agreed to act as joint lead agency with the BLM in the preparation of the EIS in accordance with the National Environmental Policy Act of 1969, as amended (NEPA).

ES.1.1 BLM and Western's Purpose and Need

The purpose of the BLM's federal action is to respond to TransWest's application for a right-of-way (ROW) to construct, operate, maintain, and decommission a transmission line on public lands. The need for this action is to fulfill BLM's responsibility under the Federal Land Policy and Management Act of 1976 and BLM ROW regulations to manage the public lands for multiple uses, including transmission of electric energy (43 Code of Federal Regulations 2806).

Western's purpose and need is to carry out Federal policy to facilitate renewable energy development and transmission expansion as established by the American Recovery and Reinvestment Act's 2009 amendment of the Hoover Power Plant Act of 1984 (Public Law 98-381, Title III, § 301) (Hoover Act). The Hoover Act provides Western the authority to borrow funds from the U.S. Treasury to construct, finance, facilitate, plan, operate, maintain, and/or study construction of new or upgraded electric power transmission lines and related facilities within Western's marketing area and which would deliver or facilitate the delivery of power from renewable resources.

ES.1.2 Decisions to Be Made

BLM decisions to be made are to:

- Decide whether to grant, grant with modification, or deny a ROW to construct, operate, and maintain the proposed facilities for a transmission line on public lands;
- Decide whether one or more BLM land use plans should be amended to allow the proposed transmission line;

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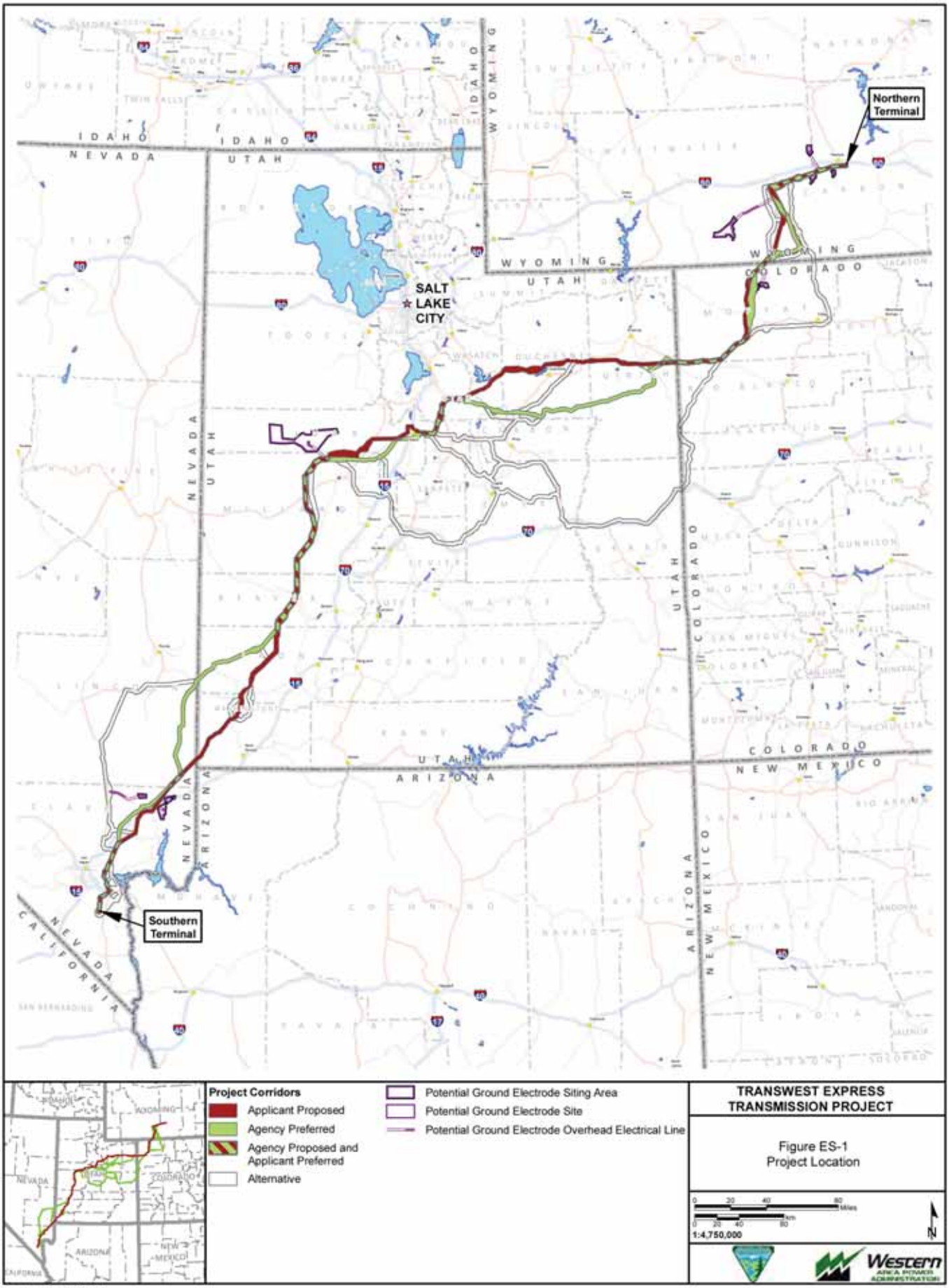

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- Determine the most appropriate location for the transmission line on public lands, considering multiple-use objectives; and
- Determine the terms and conditions (stipulations) for the construction, operation, maintenance, and decommissioning of the transmission line on public lands that should be applied to the ROW grant.

Western's decision is whether it would use its borrowing authority to partially finance and hold partial ownership with TransWest in the resulting transmission facilities and capacity.

The BLM and Western have prepared this EIS to disclose and analyze the potential direct, indirect, and cumulative impacts of the proposed action and alternatives, as required by NEPA, to facilitate public participation, and to assist the BLM and Western decision-makers in making the decisions listed above. The NEPA analysis includes disclosure of applicant-committed design features and proposed mitigation to reduce resource impacts.

Depending on the chosen alternative, this Project potentially would cross other federal lands. Accordingly, Project implementation would require other federal agencies to make decisions related to granting ROWs. The BLM has included those agencies, as well as non-federal agencies and/or municipalities with jurisdictional authority or special expertise with respect to resource issues addressed by the NEPA analysis as cooperating agencies in this EIS process. Over 50 agencies are participating in the process, including 9 federal agencies, 4 states, 24 counties, 6 conservation districts, and 1 grazing board that have signed MOUs as cooperating agencies for the Project.

ES.1.3 TransWest's Goals and Objectives for the Proposed Project

TransWest's primary goal is to provide the transmission infrastructure and capacity necessary to reliably and cost-effectively transmit up to 3,000 MW of electric power from Wyoming to the desert southwest. TransWest would work within the following Project-specific objectives:

- Provide for efficient, cost-effective, and economically feasible transmission of approximately 20,000 gigawatt hours per year of clean and sustainable electric energy from Wyoming to markets in the desert southwest region;
- Meet North American Electric Reliability Corporation Reliability Standards and Western Electricity Coordinating Council planning criteria and line separation requirements;
- Maximize use of existing and designated utility corridors and access roads to the extent practical;
- Provide these benefits in a timely manner to the desert southwest region and the broader Western U.S. to meet the region's pressing environmental and energy needs. TransWest has identified a need for the Project by the expected in-service date of 2015 or as soon as the regulatory reviews can be completed; and
- Provide for flexibility and maximize the use of infrastructure to increase future transmission capacity by configuring the Project to allow for future interconnection with the Intermountain Power Project (IPP) transmission system near Delta, Utah.

ES.1.4 Conformance with Existing Plans and Regulations

Actions that result in a change in the scope of resource uses, terms, conditions, and decisions of federal agency land use plans, including the approval of this proposal, may require amendment of one or more of the plans.

The BLM, Western, and cooperating agencies worked together to develop routes that would conform to existing federal land use plans. However, this objective was not reached for a number of the alternative routes analyzed in the Draft EIS. Plan amendments that would be necessary to implement each of the evaluated alternatives were identified by affected agencies and analyzed in Chapter 4.0 of the Draft EIS. The specific

land use plan amendments that are needed will depend upon which route is selected in the agencies' Records of Decision (RODs). In the Final EIS, the BLM will identify the agency preferred alternative and the requisite proposed plan amendments necessary to implement that alternative.

Each of the proposed BLM plan amendments would: 1) expand an existing utility corridor; 2) create a new utility corridor while allowing for exceptions to other resource stipulations if avoidance measures or impact minimization are not feasible within the designated corridor; or 3) create a one-time exception through a ROW exclusion area. Depending on the route alternative, potential plan amendments include the following:

- Region I. One or two plan amendments would be required. The BLM Rawlins (Wyoming) and Little Snake (Colorado) Field Offices (FOs) plans may be affected.
- Region II. One or up to four plan amendments would be required. The BLM White River (Colorado), Vernal, Price, and Salt Lake (Utah) FOs, and the Fishlake National Forest (Utah) plans may be affected.
- Region III. None or one plan amendment would be required. The BLM Caliente (Nevada) FO plan may be affected.
- Region IV. None or one plan amendment would be required. The BLM Las Vegas (Nevada) FO plan may be affected.

Other BLM or USFS management plans could be amended depending upon the specifics of the route that is selected in the ROD. Proposed amendments to plans that potentially are affected by the various alternatives are identified and analyzed in the Draft EIS.

Chapter 4.0 describes the proposed plan amendments required under each alternative, followed by an analysis of the environmental impacts and planning implications associated with adoption of these amendments. **Table A-1** in **Appendix A** provides a list of the major federal, state, and local permits and approvals that could be required for construction, operation, and maintenance of the Project.

ES.1.5 Agency and Public Participation

BLM and Western conducted pre-scoping activities in 2009 and 2010 with the BLM FOs, USFS, and the cooperating agencies. Comments received during pre-scoping were considered in developing the alternative corridors presented to the public during the scoping period. The Notice of Intent for the Project was published in the Federal Register on January 4, 2011, and a Project newsletter was concurrently mailed to approximately 23,000 interested parties. The BLM and Western held 23 public scoping meetings throughout the Project area. The meetings were advertised through display advertisements in local newspapers and public service announcements were submitted for broadcast on local media. The BLM and Western received a total of 622 scoping comment submittals. Through the scoping process, the following concerns were expressed:

- Corridor alternatives, as related to avoidance of sensitive resources, including special status species habitat, impacts to visual resources, areas with special designations or management, and/or historic or cultural sites;
- Conflicts with existing or potential future land uses;
- Impacts to fish, wildlife, vegetation, special status species, and habitat including greater sage-grouse; big game migration and winter/spring range habitat for elk, mule deer, and pronghorn; bighorn sheep and desert tortoise habitat; habitat loss for raptors and migratory bird species; potential for increased bird collisions with transmission lines; and development of mitigation measures;
- Public health and safety, including fire risk, firefighter safety, electromagnetic fields, potential sabotage activities, structure/conductor failure near homes and increased construction traffic on roadways;

- Impacts to areas with special management designations, including to BLM Areas of Critical Environmental Concern (ACECs), BLM Wilderness Study Areas (WSAs), USFS Inventoried Roadless Areas (IRAs), national monuments/landmarks, national historic trails, and state and federal parks;
- Cumulative impacts of numerous transmission lines being proposed within already overcrowded corridors;
- Socioeconomic impacts, particularly property values and tax base where the Project would cross private lands or be located near urban areas; and
- Noxious weed control and reclamation, including potential for the spread of noxious and invasive weeds along new ROWs, and the need for appropriate control measures.

Cooperating agency participation continued to occur during the preparation of the EIS. The public is encouraged to review and provide comment during the Draft EIS comment period.

ES.2 Proposed Action and Alternatives

ES.2.1 Proposed Action

The Applicant proposed action would consist of the following facilities and improvements:

- A 600-kilovolt (kV) DC transmission line, approximately 725 miles in length, extending across public (state and federal) and private lands in Wyoming, Colorado, Utah, and Nevada. The transmission line ROW would be approximately 250 feet wide.
- Two terminal stations to be located on private or public lands at either end of the transmission line, near Sinclair, Wyoming, and at the Marketplace Hub in the Eldorado Valley, near Boulder City, Nevada.
- Access routes, including improvements to existing roads, new overland access, and new unpaved roads to access the proposed Project facilities and work areas during the construction, operation, and maintenance Project phases.
- Two ground electrode facilities to be located on private or public lands within 100 miles of each of the Northern and Southern terminals. These ground electrode facilities would be used to maintain system operations in the event of the loss of one or more poles (or circuits).
- Communication systems: a network of 12 to 15 fiber optic communication and regeneration sites, typically within the 250-foot-wide transmission line ROW, and microwave facilities at each terminal.

ES.2.1.1 Design Options

Two design options have been included to maintain Project flexibility. Under Design Option 2, the Project would construct a 600-kV DC transmission line to deliver energy from the Northern Terminal in Sinclair, Wyoming, to a new alternating current (AC)/DC converter station near the existing IPP substation near Delta, Utah. From the new AC/DC converter station in Utah, a single circuit 1,500-MW, 500-kV AC transmission line would be constructed to one of the existing substations in the Eldorado Valley, south of Boulder City, Nevada (Marketplace Hub).

Under Design Option 3, the Project would utilize a two-phase approach. During phase one, the portion of the transmission line from Sinclair, Wyoming, to the IPP substation near Delta, Utah, would be constructed (with 3,000-MW, 600-kV DC capability for phase two conversion) and operated as a 1,500-MW, 500-kV AC transmission system. Phase two would involve constructing the remaining portion of the 3,000-MW, 600-kV DC line from IPP to the Southern Terminal, south of Boulder City, Nevada, construction of the Northern and Southern terminals and ground electrode systems, and converting operations to a DC system. This approach would be required if the demand for Wyoming resources in the desert southwest proves to be slower in development than expected.

Implementation of the design options would only be considered under the conditions that sufficient capacity became commercially available to transmit energy delivered by the Project to California, and that the Project was able to establish commercial interconnection agreements with the utility owning and operating the IPP transmission line.

ES.2.1.2 Alternative Route Planning

In developing a proposed route to facilitate the transmission of power to markets in the desert southwest region, multiple regional corridor studies were conducted. The Project history and process used in evaluating alternatives while developing the applicant's proposed route is documented in TransWest's Project Description Technical Report (PDTR) (**Appendix D**). The lead agencies conducted a corridor refinement process to identify potentially feasible corridors to be analyzed in the EIS, eliminating corridors that were duplicative or presented extensive resource constraints. The following criteria were used to retain alternatives for detailed analysis in the EIS:

- Does the alternative meet the applicants' required objectives for the proposed Project?
- Is the alternative technically and economically feasible?
- Does the alternative address resource conflicts?
- Does the alternative result in measurably diminished adverse environmental effects (fewer detrimental effects, less severe effects, or shorter-term effects) than the applicant's proposed corridor for any resource?

After receiving and addressing input from the BLM Interdisciplinary Team and cooperating agency reviewers, a range of alternative corridors were presented to the public during the public scoping period (January through April 2011). Scoping comments identified several issues that helped to inform the lead agencies' identification of those alternative corridors to retain for further analysis.

ES.2.1.3 Elements Common to all Action Alternatives

Regardless of the transmission route or design option selected, there are specific Project requirements, constraints, and Project elements that apply to all action alternatives. These elements include federal environmental protection requirements and plan amendments, applicant-committed design features and environmental protection measures, and the facilities associated with the Northern and Southern terminals.

ES.2.1.4 Transmission Line Design, Construction, Operation and Maintenance

The EIS Project description of alternatives and ancillary facilities was developed from the Project Preliminary Plan of Development (TransWest 2010) and from the PDTR (**Appendix D**). Chapter 2.0 provides descriptions of typical transmission line construction ROW and temporary work areas, the three types of transmission line structures under consideration, and typical tower erection and conductor stringing construction processes. Additional details on proposed Project facilities, construction methods, Project operation, and maintenance practices, including vegetation management, are provided in **Appendix D**.

During construction, the majority of the disturbance areas would be within the 250-foot-wide transmission line ROW; all disturbance areas would be located within the 2-mile transmission line corridor. During the operation and maintenance of the transmission line, tower location sites and communication sites would remain disturbed in place and all would be located within the 2-mile transmission line corridor. Access roads also would be located within the 2-mile transmission line corridor, to the extent practicable.

ES.2.1.5 Northern and Southern Terminals

Terminals would be located at both the northern and southern ends of the Project. Both terminal stations would include an AC/DC converter station and adjacent AC substation. The AC/DC converter station would include a 600-kV DC switchyard; AC/DC conversion equipment; transformers; and multiple equipment, control,

maintenance, and administrative buildings. Two buildings would house the AC/DC conversion equipment; smaller buildings would house the control room, control and protection equipment, auxiliary equipment, and cooling equipment. Connections to the existing transmission infrastructure also would be constructed. The three major components (AC/DC converter station, 500-/230-kV AC substation, and 230-kV AC substation) are planned to be co-located and contiguous.

The Northern Terminal would be located approximately 3 miles southwest of Sinclair, Wyoming (Carbon County), on private lands. The Southern Terminal would be located at the Marketplace Hub in the Eldorado Valley, approximately 15 miles southwest of the metropolitan area of Boulder City, Nevada.

If Design Option 2 was implemented, the Northern Terminal would be constructed as in the proposed action. The Southern Terminal would be relocated to the IPP in Millard County near Delta, Utah. If Design Option 3 was implemented, a substation would be constructed near IPP under phase one and the Southern Terminal would be constructed in Nevada under phase two.

Section 2.4.3.1, Northern and Southern Terminals, provides descriptions of the Northern and Southern Terminal facilities and disturbance areas.

ES.2.1.6 Ground Electrode Systems

One ground electrode system would be required within approximately 100 miles of each of the Northern and Southern terminals to establish and maintain electrical current continuity during normal operations, and any unexpected outage of one of the two poles (or circuits) of the 600-kV DC terminal or converter station equipment. Facilities would consist of a small above-ground building and surrounding underground electrode bed wells and a lower voltage connector line from the 600-kV DC transmission line to each of the conceptual ground electrode sites. General siting areas and conceptual alternative site locations have been identified in Regions I and III; selection of specific location of the ground electrode systems would be identified during final engineering and design stages. The alternative route and potential design option selected would influence which set of ground electrode location alternatives could be considered for use.

ES.2.1.7 Project Design Features, Best Management Practices, and Required Stipulations

Project design features, best management practices (BMPs), and required stipulations are requirements for the construction, operation, maintenance, and decommissioning of the transmission line, regardless of which alternative is chosen in the ROD. These actions were all developed or mandated to avoid, minimize, or reduce impacts to resources and are required for implementation of the Project on BLM and USFS lands. **Appendix C** contains applicant-committed design features and environmental protection measures that TransWest voluntarily has proposed to minimize and/or avoid resource impacts regardless of land jurisdiction. TransWest has committed to review and augment their list of applicant-committed design features as needed to minimize impacts to the extent possible, as well as ensure conformance with all BMPs and resource- or area-specific stipulations related to surface disturbing activities from all pertinent resource management plans (RMPs) and land resource management plans.

ES.2.1.8 Route Action Alternatives

Due to the length of the transmission line, the alternative transmission routes were split into four distinct regions for the purpose of presenting clear impact comparisons between alternative segments:

- Region I: Sinclair, Wyoming, to northwest Colorado near Rangely, Colorado;
- Region II: Northwest Colorado to IPP near Delta, Utah;
- Region III: IPP to North Las Vegas, Nevada; and
- Region IV: North Las Vegas to Marketplace Hub near Boulder City, Nevada.

The alternative transmission line routes are depicted by region in **Figures 2-21** through **2-24**. The alternatives within each of these regions can be combined to define a distinct end-to-end route from Wyoming to Nevada.

Each alternative route is defined by a reference line, a nominal 250-foot-wide transmission line ROW, and a 2-mile transmission line corridor. Potential refinements to the reference line, referred to as micro-siting options, represent adjustments requested by the agencies to minimize resource or siting constraints. Final transmission line alignments and 250-foot-wide transmission line ROW locations would be determined during final engineering; however, all alignment changes would remain within the 2-mile transmission line corridor. Corridor alternative variations and alternative connectors also have been included in some locations to address specific regional or local concerns, or to provide additional routing flexibility in constrained areas. **Tables 2-3** and **2-4** summarize alternative variations and micro-siting options and alternative connectors by region.

The following subsections outline the alternative routes as well as the micro-siting options, variations, and connectors, by region.

ES.2.1.9 Region I: Sinclair, Wyoming, to Northwest Colorado near Rangely, Colorado

Region I alternative routes, micro-siting options, alternative variations, alternative connectors, and ground electrode system alternative facilities are depicted on **Figure 2-21**.

Alternative I-A (Applicant Proposed)

TransWest's proposed reference line would begin in Sinclair, Wyoming, and would travel west just south of the I-80 corridor to Wamsutter. At Wamsutter, it would turn south and generally follow the Carbon-Sweetwater county line along a corridor preferred by the Wyoming Governor's Office and Carbon and Sweetwater counties. It then would continue south-southwest across the Wyoming-Colorado state line and south along a corridor preferred by Moffat County where it would intersect with U.S. Highway 40 just west of Maybell, Colorado. The reference line generally would parallel U.S. Highway 40, turning west toward the Colorado-Utah border.

Alternative I-B

Alternative I-B was the TransWest original proposed action. It was subsequently withdrawn and replaced by a revised ROW application reflecting their current proposed action. It was retained as Alternative I-B because it would follow an existing utility corridor, thereby reducing the proliferation of new corridors. The alternative would be the same as Alternative I-A to Wamsutter, and then differ as Alternative I-B would continue west for several miles before turning south along the West-wide Energy Corridor (WWEC). Alternative I-B would follow the WWEC to near the Colorado state line, where it would converge with Alternative I-A for approximately 15 miles, then diverge to the south and parallel Alternative I-A to the east with an offset of approximately 5 miles. It then would intersect with U.S. Highway 40 and follow Alternative I-A to the end of Region I.

Alternative I-C

This alternative was developed to reduce the overall proliferation of utility corridors and associated impacts by following existing designated utility corridors. Alternative I-C would begin by following Alternative I-A to near Creston, Wyoming, where Alternative I-C would turn south and parallel Wyoming State Highway 789 toward Baggs, Wyoming. From there, Alternative I-C would continue south, deviating from Highway 789 to the east and passing east of Baggs. After crossing into Colorado, this alternative would parallel Colorado State Highway 13 into Craig, Colorado. Alternative I-C would pass east and south of Craig, turning to the west after crossing U.S. Highway 40, generally paralleling the highway and joining with Alternative I-A to the end of Region I.

Alternative I-D (Agency Preferred)

Alternative I-D was developed to reduce multiple resource concerns, including impacts to visual resources and greater sage-grouse. It would follow the route of Alternative I-A, going west from Sinclair, Wyoming (Carbon County, Wyoming), basically paralleling I-80 in a designated WWEC, until turning south near Wamsutter. It would follow Alternative I-A south for approximately 15 miles. Alternative I-D then would diverge to the east, where it generally would parallel Highway 789 at an offset distance of 2 to 5 miles to the west. Before reaching the Baggs area, Alternative I-D would turn west and follow the Shell Creek Stock Trail road for approximately 20 miles, where it would cross into Sweetwater County and again join Alternative I-A while turning south into Colorado (Moffat County).

Region I Alternative Variations, Alternative Connectors, and Micro-siting Options

There are no alternative variations within Region I. Four alternative connectors were developed in Region I to provide the flexibility to combine alternative segments to address resource conflicts. Micro-siting options have been developed to address specific land use concerns in all Region I alternative routes related to the Tuttle Ranch Conservation Easement.

Region I Ground Electrode System Alternative Facilities

There are eight potential locations for ground electrode systems in Region I. Three locations would apply to all alternatives; the remaining five locations would apply to only certain alternatives.

ES.2.1.10 Region II: Northwest Colorado to IPP near Delta, Utah

Region II alternative routes, micro-siting options, alternative variations, and alternative connectors are depicted on **Figure 2-22**. There are no ground electrode system alternative facilities in Region II.

Alternative II-A (Applicant Proposed)

The TransWest proposed reference line would continue into Utah in a westerly direction, then deviate south from Highway 40 toward Roosevelt, Utah. From Roosevelt, it would pass north of Duchesne, again paralleling Highway 40 for several miles, then turn southwest toward Nephi, near U.S. Highways 6 and 89. The reference line would pass through Salt Creek Canyon then north around Nephi. It would continue west and then turn southwest following a path north of and adjacent to IPP. Portions of this corridor have been identified as preferred in a joint resolution by representatives of Juab and Millard counties.

Alternative II-B

Alternative II-B was developed to address impacts to private lands and to generally follow established utility corridors. These corridors are designated for underground utilities only and use of the corridor for the transmission line would require a plan amendment. The route would travel southwest in Colorado from the beginning of Region II, cross the Yampa River, and pass east of Rangely, Colorado. It would continue southwest where it would cross the Colorado-Utah state line and turn generally south, crossing back into Colorado in the Baxter Pass area. At that location, it would intersect the Interstate 70 (I-70) corridor, turning in a southwesterly and westerly direction, paralleling I-70. After passing south of Green River, Utah, Alternative II-B would diverge from I-70 and turn to the north along U.S. Highway 191. This highway generally would be followed until just south of the Emery-Carbon county line, where Alternative II-B would turn west and pass near the county line for approximately 25 miles. It generally would turn south, passing west of Huntington, Utah, before turning northwest passing northeast of Mount Pleasant, Utah. From there, it would pass through Salt Creek Canyon to Nephi, and then south around Nephi. It then would turn southwest and west adjacent to IPP, following a path south of Alternative II-A.

Alternative II-C

Alternative II-C also would decrease impacts to private lands and generally would follow established utility corridors as well as avoid USFS IRAs. Alternative II-C would follow Alternative II-B through Colorado, along

I-70 into Utah, and north at Highway 191. Approximately 15 miles north on Highway 191, Alternative II-C would diverge from Alternative II-B and turn in a general westerly direction toward Castle Dale. Approximately 3 miles east of Castle Dale, this alternative would turn south and roughly parallel Utah State Highway 10 at a distance of approximately 3 miles to the east. The alternative would cross Highway 10 near the Emery-Sevier county line and turn west, again generally following the I-70 corridor into the Salina, Utah, area. Alternative II-C would pass south of Salina, turn north, and parallel U.S. Highway 50 toward Scipio, Utah. The alternative would turn west and pass Scipio on the south, then turn north, passing east of Delta, Utah, continuing into IPP.

Alternative II-D

This alternative was developed to avoid USFS IRAs and to provide additional northern route options to avoid impacts to historic trails and areas designated for special resource management along the southern routes (Alternatives II-B and II-C). It would begin along the same route as Alternative II-A. However, as it would enter Utah, it would diverge briefly to follow a designated utility corridor, causing it to zigzag once across Alternative II-A. It then would diverge to the south of the designated utility corridor and turn west-southwest. Alternative II-D would cross into Carbon County northwest of Price, and then turn southwest in the Emma Park area along Highway 191. It would follow this highway west of Helper, and then turn west toward Salt Creek Canyon where it would join and follow Alternatives II-B and II-E, then join and follow Alternative II-A into IPP.

Alternative II-E

Alternative II-E also was developed to provide additional northern route options to address the previously-mentioned resource impacts from the southern routes. This alternative would follow Alternative II-D into Utah and along the designated utility corridor, zigzagging across Alternative II-A. It then would rejoin Alternative II-A to continue east through Duchesne, Utah. Approximately 10 miles east of Duchesne, Alternative II-E would turn southwest and generally parallel Highway 191, offset by 1 to 6 miles. At the Utah-Carbon county line, this alternative would turn west through the Emma Park area, then northwest along U.S. Highway 6 until it would rejoin with Alternative II-A, following its siting to Salt Creek Canyon. At this canyon, Alternative II-E would begin to follow the alignment of Alternative II-B south of Nephi, then join and follow Alternative II-A adjacent and into IPP.

Alternative II-F (Agency Preferred)

This alternative combines portions of other alternatives in the region and contains unique segments in the Emma Park area that together would minimize impacts to USFS IRAs, Tribal and private lands, greater sage-grouse habitat, and avoid impacts to NHTs. It would begin in southwest Moffat County (Colorado) by following Alternative II-A in designated WWEC and BLM utility corridors. As it enters Utah (Uintah County), it would separate from Alternative II-A to the northwest and follow the designated utility corridors, which then turn southwest and cross Alternative II-A. It then would diverge to the south off of the designated WWEC (still following the BLM-designated corridor) and turn west-southwest, crossing the Uintah and Ouray Indian Reservation. It then would cross into Duchesne County, where it would turn west-southwest out of the BLM utility corridor and generally follow the southern county line, crossing into Carbon County northwest of Price where it would turn west-northwest and follow Highway 6 to Thistle (Utah County) through a portion of designated WWEC and BLM utility corridors. It then would turn south, following Highway 89 for about 10 miles before cutting south-southwest (Sanpete County) to Highway 132. At this highway, it would turn west into Nephi (Juab County) and follow a path south around the community, then turn southwest following a BLM-designated utility corridor that turns west into IPP north of Delta (Millard County), which is the end of the Project's Region II.

Region II Alternative Variations, Alternative Connectors, and Micro-siting Options

One alternative variation was developed to address potential impacts to the scenic and recreation issues along the Reservation Ridge Scenic Backway, while also considering BLM policy (IM 2012-043) regarding greater sage-grouse. Five alternative connectors were developed in Region II to provide the flexibility to combine alternative segments to address resource conflicts. Micro-siting options have been developed to address concerns with construction in Uinta National Forest IRAs at a location where the designated WWEC offsets

from a continual corridor in Alternative II-A, and within USFS IRAs along the edges of the Manti-La Sal National Forest in Alternatives II-A, II-E, and II-F.

ES.2.1.11 Region III: IPP to North Las Vegas, Nevada

Region III alternative routes, alternative variations, alternative connectors, and ground electrode system alternative facilities are depicted on **Figure 2-23**. There are no micro-siting options in Region III.

Alternative III-A (Applicant Proposed)

The TransWest proposed reference line would leave IPP to the west and turn south toward Milford, Utah, following the WWEC. For the remainder of Utah, the reference line roughly would parallel Interstate 15 (I-15) approximately 20 miles west of the highway. The reference line would pass west of Milford, then generally trend south-southwest, passing east of Enterprise, Utah, and directly west of Central, Utah; exiting Utah just north of the southwest corner of the state. In Nevada, the line would cross I-15 west of Mesquite, Nevada, and remain on the south side of I-15 until reaching the North Las Vegas area northeast of Nellis Air Force Base.

Alternative III-B (Agency Preferred)

Alternative III-B was developed to decrease resource impacts in southwestern Utah (including potential impacts to the Mountain Meadows National Historic Landmark and Site and IRAs in the Dixie National Forest). It would begin following Alternative III-A through Millard and Beaver counties. Near the Beaver-Iron county line, it would diverge toward the west. Alternative III-B would follow a west-southwest course, crossing into Lincoln County, Nevada, near Uvada, Utah, where it would turn to a general southerly direction, rejoining Alternative III-A to the northwest of Mesquite. It then would diverge to the west from Alternative III-A approximately 16 miles west of Mesquite, cross into Clark County, pass southeast of Moapa, Nevada, pass through the designated utility corridor on the Moapa Reservation, and rejoin Alternative III-A approximately 4 miles north of the end of Region III.

Alternative III-C

Alternative III-C also was developed to address the same resource impacts as Alternative III-B and to take advantage of an existing corridor with existing transmission line development, thereby potentially consolidating cumulative transmission line impacts. This alternative would follow Alternatives III-A and III-B before diverging from them shortly after traveling west out of IPP, where it would follow the existing IPP power line to the south for approximately 30 miles and then rejoin Alternative III-B to the Utah-Nevada state line. After passing into Nevada at Uvada, Alternative III-C would turn west away from Alternative III-B, passing north of Caliente, Nevada; turning south approximately 15 miles west of Caliente. This alternative would follow that southern course, intersecting with U.S. Highway 93 and paralleling the highway for all but the last 15 miles into North Las Vegas. Alternative III-C would rejoin Alternative III-A northeast of Nellis Air Force Base at the end of Region III.

Region III Alternative Variations and Alternative Connectors

Three alternative variations were developed to address potential impacts to the Mountain Meadows National Historic Landmark resulting from Alternative III-A. Two alternative connectors were developed in Region III to provide the flexibility to combine alternative segments to address resource conflicts.

Region III Ground Electrode System Alternative Facilities

There are eight potential locations for ground electrode systems in Region III. Three of the locations would apply only to Alternative III-A, three would apply only to Alternative III-B, one would apply only to Alternative III-C, and one would apply only if Design Option 2 were to be implemented.

ES.2.1.12 Region IV: North Las Vegas to Marketplace Hub near Boulder City, Nevada

Region IV alternative routes, alternative variations, and alternative connectors are depicted on **Figure 2-24**. There are no micro-siting options or ground electrode system alternative facilities in Region IV.

Alternative IV-A (Applicant Proposed and Agency Preferred)

The TransWest proposed action would follow a designated WWEC, pass North Las Vegas to the east, and cross the congressionally designated Sunrise Mountain Instant Study Area (ISA). Crossing the ISA may entail congressional legislation modifying the designation (see Section 3.15, Special Designations, for details). It would run between Whitney, Nevada, and the Lake Las Vegas development skirting the edge of Henderson, Nevada. It would then turn in a general southwest direction to the Marketplace endpoint.

Alternative IV-B

Alternative IV-B was developed to provide an alternative that does not require crossing the Sunrise Mountain ISA. It would follow the proposed alternative for approximately 7 miles, diverge to the southeast as it passed directly east of Nellis Air Force Base and travel south through the Lake Mead National Recreation Area (NRA), passing between the Lake Las Vegas development and Lake Mead. Along the south edge of Lake Las Vegas, it would turn southwest, north of Boulder City, Nevada, then turn west and join with Alternative IV-A west of Henderson to the Marketplace endpoint.

Alternative IV-C

Alternative IV-C also would provide an alternative that does not cross Sunrise Mountain ISA. In addition, it would decrease impacts to populated areas. This alternative would follow Alternative IV-B through the Lake Mead NRA and between the Lake Las Vegas development and Lake Mead to north of Boulder City. It would then continue south before it turned southwest around the southeast edge of Boulder City, and into the Marketplace endpoint.

Region IV Alternative Variations and Alternative Connectors

One alternative variation was developed to address impacts to private lands. Five alternative connectors were developed in Region IV to provide the flexibility to combine alternative segments to address resource conflicts.

ES.2.2 No Action Alternative

Under the No Action Alternative, the BLM or USFS would not issue ROW grants or special use permits and the Project would not be constructed. Under the No Action Alternative, Western would not provide funding to the Project.

ES.2.3 Alternatives Considered but Eliminated

During scoping, numerous questions were raised regarding the ability to route the transmission line, or portions of the transmission line, underground. Underground cable systems have been considered and evaluated for the Project. To date, underground cable technology required to meet the applicant's objectives is not available, nor is it reasonably foreseeable that it would become available within the timeframe for the construction of the Project. Therefore, undergrounding all or portions of the Project was not considered a viable alternative and has been eliminated from further analysis.

Additionally, a number of corridor segments were considered through the public scoping period, but subsequently have been eliminated from detailed analysis in this EIS by the lead agencies. **Table 2-22** identifies the segments and notes the rationale for elimination from detailed analysis.

ES.2.4 Agency Preferred Alternative

The BLM determined the preferred alternative within each Project region with input from the cooperating agencies. The agency preferred alternative is subject to change when public input received during the Draft EIS public comment period is considered. The agency preferred alternative was identified using criteria linked to Council on Environmental Quality criteria for determining significant impacts. These criteria were broadened and refined based on input from the Project's cooperating agencies regarding other key resource concerns as follows:

1. Maximizes the use of appropriate (e.g., non-underground-only) existing designated utility corridors by locating within or paralleling areas of existing utility ROWs.
2. Minimizes the need for plan amendments through conformance to land use plans.
3. Avoids or minimizes resource impacts that are regulated by law (Endangered Species Act, Clean Water Act, National Historic Preservation Act, wilderness, WSAs, ISAs, IRAs, etc.) after consideration of Project design features and agency BMPs. This includes impacts to greater sage-grouse.
4. Avoids or minimizes proximity to private residences and residential areas, thereby addressing concerns with public health and safety, aesthetics, visual effects, and others.
5. Avoids or minimizes resource impacts that demonstrate potentially unavoidable adverse impacts (residual impacts) after consideration of Project design features and agency BMPs, even though they may not be specifically regulated by law.
6. Minimizes use of private lands, assuming natural resource impacts are more or less similar.
7. If multiple alternatives meet the preceding criteria, the agency preferred alternative would be the alternative that minimizes construction, operation, and maintenance expense and/or time.

ES.3 Affected Environment and Environmental Consequences

The following section summarizes the affected environment and environmental consequences analysis contained in Chapter 3.0 of the Draft EIS. A summary of impacts from the Project's action alternatives is provided by Project region in **Tables 2-23** through **2-26**. **Table 2-27** compares the applicant proposed route with the agency preferred route on a Project-wide basis (sum of impact parameters across the four Project regions). Cumulative impacts of the Project are presented in Chapter 5.0.

ES.3.1 Air Quality

The existing air quality of most of the analysis area is typical of the largely undeveloped regions of the western U.S. Current sources of air pollutants in the region include wildland fires, mining, agriculture, industrial sources, urban transportation, vehicular travel on unpaved roads, construction activities, and disturbed land. All of the northern portions of the analysis area have been designated as attainment areas for all pollutants that have ambient air quality standards; however, Clark County, Nevada, is designated as nonattainment or maintenance area for specific pollutants. Impacts to air quality include increases in criteria pollutants, including fugitive dust emissions, emissions of hazardous air pollutants, and green house gas emissions. Neither the construction nor operations phase of the proposed action or alternatives is expected to cause or contribute to any violation of any state or federal ambient air quality standard; interfere with the maintenance or attainment of any state or federal ambient air quality standard in the analysis area; increase the frequency or severity of any existing violations of any state or federal ambient air quality standard in the analysis area; delay the timely attainment of any standard, interim emission reduction, or other air quality milestone promulgated by the U.S. Environmental Protection Agency (USEPA) or state air quality agency; cause any adverse impacts to air quality related values; cause any adverse impact to air quality related values in a federal Class I area; or exceed state or federal general conformity thresholds. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.2 Geological, Paleontological, and Mineral Resources

The proposed Project covers several physiographic provinces including the Wyoming Basins, Colorado Plateau, Middle Rocky Mountains, and Basin and Range provinces. Region I analysis area has low earthquake activity, moderate to high susceptibility and low incidence of landslides, and contains areas that may be subject to ground subsidence. There are important fossil bearing formations and major mineral resources in the area. Region II analysis area has a number of potentially active fault zones, moderate to high incidence and susceptibility to landslides, and areas that may be subject to ground subsidence. There are important fossil bearing formations and major mineral resources in the area. Region III has several potentially active faults, generally low landslide susceptibility, and contains some areas with subsidence risk. There are three high-potential fossil-bearing formations and important mineral resources in the area. Region IV analysis area has some fault areas but ground movement from an earthquake is expected to be low and there is low incidence and susceptibility to landslides. The Las Vegas Valley experiences subsidence due to groundwater withdrawal but the analysis areas does not cross any subsidence areas. There are no high fossil potential formations in the area.

Impacts from landslides or unstable ground would result in damage to structures and ultimately disruption in service. Electrical transmission lines have reportedly been impacted by ground stability hazards on the Wasatch Plateau and structural failure and relocation of transmission line routes have resulted because of landslides due to anomalous precipitation events. Ground subsidence also would result in the loss of ground support to structures with the potential to damage and disrupt operations. The risk of damage from seismicity, landslides, or subsidence would be substantially reduced through implementation of BMPs, design features, and mitigation. The proposed Project is not expected to preclude or restrict access to minerals resources. Project construction and operation would not be expected to result in the loss or damage of scientifically important paleontological resources. Indirect impacts may occur to paleontological resources over an extended period of time because of increased access to medium to high fossil potential formations. The BMPs and design features that protect paleontological resources discussed in construction impacts would lessen the risk; however, the resource would still be at risk through the continuation of natural processes (e.g., erosion) and unauthorized collection. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.3 Soils

All four Project regions contain soils that are prone to compaction, prone to wind or water erosion, have limited revegetation potential, or which are corrosive to cement and steel structures. Additionally, Region II contains soils that are susceptible to the development of large sinkholes, piping, and subsidence. The Region I, II, and III analysis areas contain prime farmlands.

In general, the impacts to soils associated with construction of the transmission line would be temporary. Direct impacts to soil resources would include the clearing or crushing of surface cover (vegetation, duff, litter) and blading/grading of soils for structure construction. During construction, the soil profiles would be mixed with a corresponding loss of soil structure. Soil compaction would result from the movement of heavy equipment and vehicles during construction activities. Soil compaction and a reduction in ground cover would lead to an increase in bulk density, increased runoff, and erosion. Long-term losses of prime farmland could occur if structure foundations or facilities are required in prime farmlands. Agency BMPs would reduce impacts to soils from uneven settling, compacted surfaces, and physical crusts reducing water infiltration. Monitoring of erosion controls after storm events would keep erosion control in effective working order and reduce or prevent sediment from moving off-site. Implementation of design features, agency BMPs, and mitigation measures would effectively control erosion from disturbed areas reducing the loss of surface soils and potential sedimentation effects. Additional mitigation has been proposed to locate structures away from prime farmlands. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.4 Water Resources

The water resources analysis area consists of 179 hydrographic watersheds within the North Platte, Great Salt Lake, Upper Colorado, and Lower Colorado River hydrographic regions. The North Platte Region drains the

east side of the Continental Divide and ultimately empties to the Gulf of Mexico. The Upper Colorado Region, Lower Colorado Region, and Great Basin Region all drain the western side of the Continental Divide; the Upper and Lower Colorado regions ultimately drain toward the Gulf of California, while the Great Basin Region generally drains toward the Great Salt Lake. Surficial aquifers are present in the floodplains of major surface water features and the low-lying areas of the Basin and Range area. Springs and seeps are found throughout the analysis area. Region I, II, III, and IV analysis areas contain 9, 28, 11, and 3 impaired waterbodies, respectively.

Water quality could be impacted both directly and indirectly from construction of waterway crossings, which could result in channel instability and increased sediment supply from disturbed areas directly adjacent to the crossings. This may in turn cause increased sediment from mass wasting of channel banks, and down-cutting of the streambed, with resultant changes in channel geomorphology. Consultation would be conducted with the managing land agency regarding relevant standards and guidelines for waterbody road-crossing methods. Direct impacts would be greatest for short periods of time during construction and through the reclamation process until successful revegetation occurred. The applicant will develop a management plan to avoid, reduce, and/or minimize adverse impacts to any streams having impaired uses due to elevated sediment concentrations or constituents that might be present in stormwater runoff. Indirect impacts to water quality could occur from ground disturbance in upland areas when precipitation events would cause overland runoff to erode bare soils and transport sediment to waterways. The design features and BMPs discussed in the Erosion Control Plan and Storm Water Pollution Prevention Plan would minimize runoff and erosion from disturbed areas. Although increased erosion would be expected because the disturbance would be dispersed along the linear path of the Project, no alterations to the existing drainage patterns or increases of off-site erosion would be expected from the disturbance of upland areas by the Project. Because existing water rights (current depletion) would be utilized, no new impacts to other water users or the water source would be anticipated. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.5 Vegetation

There are 20 vegetation communities and developed/disturbed land located within the analysis area. The shrubland cover type is the dominant land cover type within the analysis area, comprising 54 percent of the area. Forest and woodlands cover type comprises the second largest percentage (21 percent) of the analysis area.

Direct surface disturbing impacts to vegetation would include the trampling/crushing of vegetation, the removal of vegetation, and soil compaction. Indirect effects to vegetation would include increased erosion, sedimentation, fugitive dust generation, habitat fragmentation, and the potential spread and establishment of noxious and invasive weed species. Noxious weed invasions into disturbed areas may result in incremental changes to the fire regimes for each vegetation community. The land cover type with the highest overall risk of accidental fires spreading upon ignition is sagebrush shrubland. The removal of woody vegetation over 6 feet in height could result in changes in vegetation community structure. Depending on the species present, woody communities could temporarily or permanently shift to communities dominated by herbaceous and/or low growing shrubs. In addition, increased light and open areas in the ROW could lead to increased noxious and invasive weed species establishment and spread. Although vegetation communities would recover at varying rates, it is estimated that overall, herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations. Woody-dominated plant communities would require at least 10 to 25 years for recolonization; re-establishment of mature woodlands would require at least 30 to 50+ years. Depending on composition, recovery could take up to 31 to 100 years to achieve mature trees of similar stature to pre-construction conditions. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.6 Special Status Plant Species

A total of 304 special status plant species were evaluated for potential occurrence within the 2-mile transmission line corridor. After consideration of habitat requirements and known distribution, 141 special

status plant species were carried forward for detailed analysis in this EIS. This includes 15 federally listed and 3 candidate species. Region II contains the highest number of special status plant (84) followed by 51 species in Region III. Region I and IV each contain fewer than 25 species.

The types of direct and indirect effects of construction activities generally are the same as those discussed for vegetation resources, and could result in loss of individuals and/or populations and loss of potentially suitable habitat. Other direct effects include the potential loss of pollinators, increased opportunities for illegal collection of individual special status plant species, and habitat fragmentation. Additional indirect impacts associated with operations would result from the vegetation maintenance for the ROW. Design features, BMPs, and additional proposed mitigation would reduce these impacts.

Based on species occurrence information and habitat associations, the special status plant species that may be impacted by the Project in Region I include 23 BLM sensitive species and 1 federally listed species. Within Region II, there are 62 BLM sensitive species, 18 USFS sensitive species, and 14 federally listed plant species that may be impacted by the Project. Within Region III, there are 46 BLM sensitive species, 2 USFS sensitive species, 5 Nevada state-listed species, and 4 federally listed species that may be impacted by the Project. Within Region IV, there are 18 BLM sensitive species, 8 NPS sensitive species, 5 Nevada state-listed species, and 1 federally listed species that may be impacted by the Project. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.7 Wildlife

Big game species that occur within the analysis area include pronghorn, mule deer, white-tailed deer, elk, moose, Rocky Mountain bighorn sheep, and desert bighorn sheep. Small game species that occur within the analysis area include upland game birds, small mammals, furbearers, and waterfowl. A diversity of nongame species (e.g., small mammals, raptors, passerines, and reptiles) occupies a variety of habitat types within the analysis area.

Construction-related impacts primarily are habitat loss, fragmentation, and wildlife mortalities as a result of vehicle collisions and crushing of nests/burrows. Implementation of design features and agency restrictions to prevent disturbance to wintering big game species in identified crucial winter habitat would minimize direct impacts to wintering big game species. Similarly, direct impacts to small game would be limited during sensitive periods (e.g., nesting and breeding). TransWest also has committed to implementing raptor seasonal timing restrictions in applicable areas. Remaining impacts to wildlife would be limited to habitat loss and/or fragmentation. Similarly, noise and human presence impacts to wildlife species would be limited to habitat loss outside of key breeding times within important habitat types and protection buffers.

The primary operation-related impact associated with transmission lines and associated facilities is wildlife mortalities as a consequence of electrocution or collision with transmission line components. Other potential impacts include habitat avoidance due to the presence of a transmission line or maintenance noise and human presence. To minimize potential operation-related impacts to wildlife as a result of the proposed Project, TransWest's design feature requires that the Project meet or exceed the raptor safe design standards described in the Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interactive Committee 2006). Anti-perching within key greater sage-grouse habitat also would benefit other wildlife prey species. Even with implementation of the proposed design features, there would be some remaining potential for avian collisions with the transmission line and towers. However, the potential for electrocution impacts to bird species would be negligible. Wildlife prey species also would be impacted given the potential for increased avian predator populations nesting on power line structures. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.8 Special Status Wildlife Species

A total of 120 special status wildlife species were carried forward in this EIS: 12 terrestrial invertebrates, 19 reptiles, 51 birds, and 38 mammals. There are 12 federally listed wildlife species (1 reptile, 7 birds, and

4 mammals) within the Special Status Wildlife Analysis Area, as well as 2 federal candidate species (greater sage-grouse and western yellow-billed cuckoo).

Construction impacts account for all disturbances caused during construction of the proposed Project, including vegetation removal, increased human activity, and increased noise levels. The primary impacts associated with operation of transmission lines and associated facilities are mortalities as a consequence of electrocution or collision with Project components.

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include 2 federally listed and 2 candidate species and 64 BLM sensitive and state-protected species. The federally listed and candidate special status species are the greater sage-grouse (Candidate), western yellow-billed cuckoo (Candidate), black-footed ferret (Endangered; Experimental Non-essential), and the grey wolf (Endangered in Utah and Colorado; Experimental Non-essential in Wyoming). Region I impacts by alternative are shown in **Tables 2-23**.

Special status wildlife species that maybe impacted in Region II include 5 federally listed and 2 candidate species and 65 BLM sensitive, USFS sensitive, and state-protected species.

The federally listed and candidate special status species are the greater sage-grouse (Candidate), western yellow-billed cuckoo (Candidate), Mexican spotted owl (Threatened), black-footed ferret (Endangered), Canada lynx (Threatened), grey wolf (Endangered in Utah and Colorado), and the Utah prairie dog (Threatened). Region II impacts by alternative are shown in **Tables 2-24**.

Special status wildlife species that may be impacted in Region III include 5 federally listed and 2 federal candidate species and 77 BLM sensitive, USFS sensitive, and state-protected species. The federally listed and candidate special status species are the desert tortoise (Threatened), California condor (Endangered; Experimental Non-essential), greater sage-grouse (Candidate), Yuma clapper rail (Endangered), western yellow-billed cuckoo (Candidate), southwestern willow flycatcher (Endangered), and the Utah prairie dog (Threatened). Region III impacts by alternative are shown in **Tables 2-25**.

Special status wildlife species that may be impacted in Region IV include 3 federally listed and 1 federal candidate species and 65 BLM sensitive, USFS sensitive, and state-protected species. The federally listed and candidate special status species are the desert tortoise (Threatened), western yellow-billed cuckoo (Candidate), southwestern willow flycatcher (Endangered), and the Yuma clapper rail (Endangered). Region IV impacts by alternative are shown in **Tables 2-26**.

ES.3.9 Aquatic Biological Resources

There are 26 game fish species, subspecies, or hybrids that occur within the analysis area. Most of the species are trout; other species are from the catfish, sunfish, temperate bass, perch, sturgeon, and smelt families. Waterbodies within the analysis area also support nongame fish species represented by suckers, minnows, and sculpins; invertebrate communities that include a mixture of worms, immature and adult insect groups, crustaceans, snails, and other groups; and habitat for amphibians (salamanders, toads, and frogs) and aquatic reptiles (turtles). Aquatic invasive species and whirling disease are issues within streams and lakes/reservoirs in all four states.

Equipment and vehicle traffic within the ROW and access roads could cross small and moderate-size streams or springs. Vehicle crossings would result in mortalities to macro invertebrates and possibly early life stages of fish. Through the implementation of BMPs, design measures, and additional mitigation measures, stream crossings would not permanently remove habitat and detrimentally affect fish population numbers, and macroinvertebrate composition and numbers would recover during subsequent colonization. Stream crossings would alter bottom substrates, and construction at stream crossings would remove riparian vegetation that provides cover for fish, shading, bank stability, and increased food and nutrient supply. The disturbed area would be restored to pre-construction conditions after construction is completed. Given the relatively small

width of the disturbance area associated with an individual stream crossing, impacts would be considered low in relation to the entire stream system.

The installation of culverts would result in a permanent loss of aquatic habitat. Stream crossings by vehicles and equipment pose a risk of transferring invasive aquatic species between drainages during construction. This risk would be reduced through Invasive Aquatic Species Protection mitigation measures. Effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed.

ES.3.10 Special Status Aquatic Species

Fifty-five special status aquatic species were evaluated in terms of potential occurrence within the analysis area. Twenty fish, 5 amphibians, and 3 invertebrates were carried forward in this EIS, including 7 federally listed and 1 candidate fish species. Aquatic habitat in the analysis area used by special status aquatic species includes streams, springs, and wetlands. No lakes or reservoirs are inhabited by special status aquatic species. Region II contained the highest number of species (19), followed by 12 species in Regions I and III. One species occurs within the Region IV analysis area.

The types of direct and indirect effects of construction activities generally are the same as those discussed for aquatic biological resources, including disturbance to aquatic habitat from vehicle crossings and culvert installation, removal of riparian vegetation, and increased in sedimentation and fuel spill risks. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

An effect determination of new and existing water depletions would be completed after identifying the water sources for construction and whether there is any connection between these water sources and surface flows in the Colorado Basin, Utah Lake/Provo River drainage, and the Platte sub-basin.

ES.3.11 Cultural Resources

The analysis area for cultural resources encompasses a 2-mile-wide corridor along each alternative, including portions of Wyoming, Colorado, Utah, and Nevada. A cultural resource files search was conducted to identify all previously conducted archaeological investigations and previously recorded cultural resources within the analysis area. There have been 122 historic sites and 72 historic components previously documented in the Wyoming portion of analysis area, 257 historic sites and 33 historic components previously documented in the Colorado portion of the analysis area, 721 historic sites and 61 historic components previously documented in the Utah portion of the analysis area, and 221 historic sites and 18 historic components previously documented in the Nevada portion of the analysis area.

The Project's ground-disturbing activities would have the potential to directly impact historic properties, including traditional cultural properties and properties of traditional religious and cultural importance to Native American Tribes. These physical impacts could occur to both known sites and subsurface sites and could result in the vertical and horizontal displacement of soil containing cultural materials, damage to or destruction of artifacts and features, and loss of archaeological data. Visual impacts to historic properties (as well as cultural/historic landscapes) where setting is an aspect of integrity could occur as a result of introducing visual elements out of character with a property located within the visual area of potential effects.

At this time, the number of historic properties that would be adversely affected by the Project is unknown. As stipulated in the draft Programmatic Agreement (PA), an intensive Class III pedestrian inventory would be required after the agency preferred alternative is selected by the BLM and Western and before construction, to allow for the National Register of Historic Places (NRHP) evaluation of identified sites, impact assessments, and mitigation, if necessary. If the BLM and Western determine that a property would be adversely affected, mitigation would be proposed in accordance with the draft PA. Visual impacts to historic properties where setting contributes to their NRHP eligibility and from which the Project would be visible would be determined through viewshed analysis, on-site inspection, and photo inspection. Adverse effects to the integrity of a

property's setting would be minimized or mitigated as stipulated in the draft PA. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the draft PA. Site file search data by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.12 Visual Resources

The analysis area for visual resources comprises the viewsheds of the Project's reference lines out to 20 miles in locations where they cross tree-covered landscapes and out to 5 miles in shrub, grassland, and cropland landscapes. Project's setting intersects the high plains, mountains, plateaus, valleys, and desert landscapes of Wyoming, Colorado, Utah, and Nevada, respectively, and includes the following physiographic provinces: Wyoming Basin Province; Uinta Basin section of the Colorado Plateaus Province; Northern Canyonlands section of the Colorado Plateaus Province; Middle Rocky Mountains Province; High Plateaus of Utah section of the Colorado Plateaus Province; Great Basin section of the Basin and Range Province; and Sonoran Desert section of the Basin and Range Province.

Visual resources impacts would occur during the construction phase of the Project and would be caused by vegetation clearing within the ROW and ground disturbance for access roads, transmission line, terminal, and electrode bed construction. Impacts would continue into the operational phase with visibility of structures, overhead conductors, cleared ROWs in tree-covered landscapes, access roads, terminal areas, and electrode bed areas and associated roads and small voltage electrical lines. In undeveloped areas, transmission line elements would contrast with existing characteristic landscapes to a moderate to strong degree. In viewsheds with existing electrical transmission line structures and ground disturbances, contrasts would be weak to moderate, depending on distance from the observer and number and type of structures. In all cases, construction activities occurring in the immediate foreground of the observer would cause greater contrasts than those appearing at a further distance. Direct impacts to people and scenery would be expected to be moderate to high and contrasts would comply with BLM Visual Resource Management (VRM) Class IV management objectives, and be consistent with USFS Low and Very Low Scenic Integrity Objectives (SIO) and USFS Modification and Maximum Modification Visual Quality Objectives (VQO). Project construction activities, as discussed in the plan of development, that are located within 0.5 mile of high or moderate sensitivity viewers and have strong or moderate contrasts, would not be expected to comply with BLM VRM Class III, or be consistent with USFS SIO High or Medium, and USFS VQO Retention or Partial Retention management objectives. Mitigations involving distances greater than 0.5 mile typically would reduce visual contrasts to moderate and, therefore, result in compliance with VRM Class III, and consistency with SIO Medium and VQO Partial Retention management objectives.

Indirect viewshed impacts would result from disturbance by human recreational activities, artifacts of activities, and vehicles with access to scenic landscapes by the Project's permanent access roads. Indirect impacts during operation would be expected to comply with agency management objectives in BLM VRM Class III and IV areas and be consistent with USFS SIO Medium and Low or USFS VQO Partial Retention, Modification, or Maximum Modification management objectives. Indirect impacts in the immediate foreground 0.25 mile from sensitive viewers may not comply with BLM VRM Class II management objectives or be consistent with USFS SIO High or USFS VQO Retention management objectives. It is expected these impacts would be mitigated (if possible) on a case-by-case basis. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.13 Recreation Resources

The majority of recreation resources within the analysis area occur on federal lands managed by the BLM and USFS. Dispersed, unstructured activities typify the recreational uses occurring on public (federal and state) lands throughout the majority of the analysis area. Dispersed recreation in the analysis area includes motorized and non-motorized activities such as undeveloped camping, fishing, hiking, horseback riding, rock and ice climbing, mountain biking, snowmobiling, caving, off-highway vehicle (OHV) trail riding or open area use, and driving for pleasure. Developed recreation sites on federal and state lands in the analysis area include campgrounds, picnic areas, information and interpretive sites, trailhead facilities, boat ramps, and

fishing accesses. Most are provided by federal agencies, though there are some city- or county-managed recreation areas as well as privately owned recreation facilities.

During construction, noise or visual presence of construction activities could temporarily affect the experiences of visitors participating in dispersed or developed recreation opportunities near the construction area (generally limited to those areas within the 2-mile transmission line corridor). Construction is expected to affect recreation use particularly on the weekends; seasons of use may vary by region. At peak construction levels, human activity would be high and noise generally would be above existing background levels within the entire width of the 2-mile transmission line corridor. Some user groups would be more affected by habitat removal, noise and visual disturbance than others; for example, hunters, wildlife viewers and non-mechanized users groups, whose recreation experience is dependent upon quiet wilderness experiences or undisturbed wildlife would be more affected than OHV users or other activities for which vegetation removal, noise, and human activity does not affect the recreation experience. Construction also could temporarily affect the ability of visitors to participate in dispersed recreation opportunities by limiting access. Operations would result in permanent visual impacts to areas along the transmission line, including areas used for dispersed recreation. While these impacts would not appreciably affect the availability of the recreation resource used while engaging in dispersed recreational activities (i.e., big game or fishing habitat), the setting in which they occur would be affected visually and some user groups may choose to recreate elsewhere. In general, suitable substitute locations would exist nearby for the same dispersed recreational activities. Exceptions are described by region. Project access routes would be evaluated on a case-by-case basis by the appropriate federal or state land manager to determine whether to close to the public, close and reclaim, or leave open as part of the transportation network. Closed roads may become an attractive nuisance and lead to unauthorized OHV use. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.14 Land Use

The analysis area includes portions of 4 states, 5 national forests, 15 BLM FOs, 24 counties, and 56 communities. Over 60 percent of the analysis area is federally managed land. The majority of the Region I analysis area is BLM land, mostly used for oil and gas production and grazing. Approximately 50 percent of the Region II analysis area is BLM land; approximately 10 percent is USFS land. Major land uses include oil and gas development, grazing, agriculture, forestry, and recreation. Over 75 percent of the Region III analysis area in is BLM land. Most of the BLM land is within military operation areas. Nearly one-third of the Region IV analysis area is BLM land and one-third is federal land managed by the NPS (Lake Mead NRA) and the Department of Energy. Major land uses include urban development in the Las Vegas metropolitan area, and recreation areas and trails associated with the conservation areas on the eastern edge of the urban area.

Impact considerations include consistency with federal, state, regional, or local land use plans; impacts to agricultural activities and/or livestock grazing; and changes to land use authorizations and effects to realty actions on federal lands. No changes to current jurisdiction from the construction and operation of the Project alternative routes are anticipated. Most of the affected counties provide for the development of large transmission lines and associated facilities through zoning regulations; however, transmission lines development is not addressed in all zoning ordinances. Locations where the Project would not conform to existing federal agency management plans are discussed in Chapter 4.0. It is not anticipated that occupied residences would be removed within the 250-foot-wide transmission line ROW under any alternative. Potential land use authorizations conflicts would be addressed on a case-by-case basis with each federal land management agency. Short-term disruption of farming activities along the ROW could occur locally during construction. With the exception of land occupied by towers and access roads, farmland and range land within the construction zone would be available for agricultural use following the completion of construction. Direct impacts to grazing include the loss of forage, fragmentation of grazing allotments, potential impacts to lambing areas and disruption of lambing periods, increased mortality and injuries to livestock resulting from increased vehicle traffic, and temporary displacement of livestock from preferred grazing areas or range improvements (including water sources). Indirect impacts would include the spread of noxious and invasive species and fragmentation of allotments. The implementation of the proposed mitigation measures would minimize impacts to range improvements. Impacts to land use by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.15 Special Designation Areas

Special designation areas (SDAs) are units of land managed by federal or state agencies for the protection and enhancement of specific resource values. Congressionally designated SDAs within the analysis area include national wildlife refuges, wilderness areas, WSAs, wild and scenic rivers (WSRs), national conservation areas (NCAs), national historic trails, and other similar management areas. Agency-designated SDAs consist of ACECs (BLM) and IRAs and unroaded/undeveloped areas (USFS).

Within Region I, the SDAs that would be impacted by one or more of the alternatives are the Continental Divide National Scenic Trail, the Dinosaur National Monument, and two trails being considered for inclusion into the National Historic Trails system (the Overland Trail and the Cherokee Trail).

Within Region II, the SDAs that would be impacted by one or more of the alternatives are the Dinosaur National Monument, Old Spanish National Historic Trail, Oil Spring Mountain WSA and ACEC, White River Riparian ACEC, McInnis Canyons National Conservation Area, Badger Wash ACEC, Demaree WSA, Lower Green River Wild and Scenic Rivers Glossary/ACEC, Lears Canyon ACEC, Nine Mile Canyon ACEC, San Rafael Canyon ACEC, and Rock Art ACEC, 5 IRAs and 6 unroaded/undeveloped areas within the Ashley National Forest, 2 IRAs and 7 unroaded/undeveloped areas within the Fishlake National Forest, 7 IRAs and unroaded/undeveloped areas within the Manti-La Sal National Forest, and 9 IRAs within the Uinta National Forest.

Within Region III, the SDAs that would be impacted by one or more of the alternatives are the Desert and Pahranagat national wildlife refuges, Old Spanish National Historic Trail, the Beaver Dam Wash NCA, Beaver Dam Slope ACEC, Mormon Mesa Ely ACEC, Beaver Dam Slope ACEC, Clover Mountains Wilderness, Kane Springs ACEC, Delamar Mountains Wilderness, Mormon Mesa ACEC, Coyote Springs Valley, Arrow Canyon Wilderness, and the Muddy River and Meadow Valley Wash WSRs. The proposed action or alternatives also would encompass portion of six IRAs and four unroaded/undeveloped areas within the Dixie National Forest. Additionally, there are four USFWS proposed wilderness areas within the analysis area.

Within Region IV, the SDAs that would be impacted by one or more of the alternatives are the Sloan Canyon NCA, Black Mountain Wilderness, Sunrise Mountain ISA, Rainbow Gardens ACEC, River Mountains ACEC, and the Lake Mead NRA. Impacts to SDAs from construction and operation of the Proposed Project depend on the location of the crossing as well as the relevant and important values for which SDA was or is being proposed to be designated. Impacts to SDAs by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.16 Transportation

The transportation analysis area includes both the national, state, and local road and railroad transportation network serving the alternative routes, as well as improved and unimproved routes within the local roadway network, railroads, airports, and controlled airspaces. Some portions of the analysis area have extensive local roadway networks (urban and suburban areas), while other portions of the analysis area have few to no local roads (rural and remote areas).

Construction of new access roads would be required in some areas to access structure sites lacking direct access from existing roads, or where topographic conditions prohibit safe overland access to the site on unpaved roads. Road construction may require temporary road closures and/or detours that create access difficulties to public and private property, but adherence to design features and agency BMPs would help to limit and plan for the closures. Project construction would create minor and incidental increases in local traffic, but is not expected to create substantial congestion for extended periods. Construction would add vehicle travel to the roadway network and could introduce travel obstructions on local roads creating potential safety issues. After considering design features, BMPs, and other Project approval requirements, minor and temporary safety issues would be created but no hazardous or unsafe conditions would be created. Increased traffic and travel on roads by heavy vehicles would contribute to local roadway degradation resulting in the

need for additional road maintenance. Overall impacts on road maintenance would be minor in flat and rolling terrain and moderate in steep and mountainous terrain.

Transmission line towers and lines are a navigation issue if they are located too close to airport operations or military airspace operating areas. The Project may create operation and safety issues near airports and may create unresolved conflicts in military airspace operating areas, but incorporation of design features and agency BMPs are expected to lessen the extent of the safety issues to permissible levels. If not, it currently is assumed that any routes with irresolvable issues related to airports or airspace would require additional mitigation to be applied, including the possibility of suggested reroutes. Impacts to transportation by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.17 Social and Economic Resources

The geographic extent of the social and economic conditions analysis area comprises 23 counties in which one or more of the alternative routes are located and the communities within those counties that are likely to host non-local construction workers associated with the Project. The analysis area is predominately rural, with the exception of the Las Vegas, Nevada, and St. George, Utah, metropolitan areas; however, social conditions and lifestyles in the analysis area vary considerably. All 23 counties in the analysis area gained population during the last decade. There are six Indian Reservations located in the analysis area.

Construction of the two terminals would entail a 27- to 28-month construction period in one location. Average direct construction employment for the Northern and Southern terminals would be 113 and 76 jobs, respectively. Benefits to firms supplying goods and services to the Project (such as contractors involved in construction, and those serving temporary lodging and consumer needs) would include increases in sales, possible new business starts, and hiring additional employees or increased hours worked for existing owners and employees. Approximately 0.7 secondary jobs would be generated in the Rawlins/Carbon County and Las Vegas Valley economies for each direct job associated with the Project. There would be temporary population influxes into the communities near the Northern Terminal, but little Project-related population influx expected in the Las Vegas Valley. Overall demand would be composed of a combination of a few ownership units, conventional single family and apartment rentals, RV/camper parking spots, and motel rooms.

Construction of the transmission line would be completed using three 200-mile “spreads,” each with its own work force, fleet of construction equipment, and schedules. Employment would average approximately 140 jobs for each spread. Approximately 0.44 secondary jobs would be generated; however, the widespread nature of the construction activity would result in a dispersal of the temporary effects across multiple communities. Impacts of transmission line construction would be similar in type to those associated with development of the terminals; primary differences stem from the movement of the construction activity along the corridor over time and associated implications for temporary housing and potential demands on emergency response as construction proceeds away from the larger towns and into more rural areas. No high and adverse effects to human health or other environmental resources have been identified as part of this assessment, effectively minimizing the potential for disproportionate affects to low-income populations or members of the potentially affected tribes or reservations. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.18 Human Health and Safety

Potential health and safety concerns related to power transmission during construction include worker injuries, exposure to hazardous materials, contaminated sites, excessive noise, and risks to workers and the community from accidents. Health and safety concerns associated with operations include electrical shock, electric and magnetic fields, corona, stray and induced voltage, collision hazards, fire risk, and public access to transmission structures and substation equipment.

Project construction would produce noise from heavy equipment needed to build the proposed transmission line routes and electrical substations. Construction noise levels would range from 74 to 88 decibels on the

A-weighted scale (dBA) at 50 feet from any work site. Noise levels temporarily would exceed the USEPA guideline for residential noise (55 dBA) at a distance of about 1,600 feet (USEPA 1974). Design features, BMPs, and mitigation measures would be used to reduce noise levels and limit sensitive receptors exposure during key time periods. Impacts associated with the release or spill of hazardous materials to the environment or people during construction or discovery of contaminated soil or groundwater are expected to be minimal with the implementation of design features. The effects of operation of the Project would involve potential electric and magnetic fields impacts on residences, sensitive receptors, nearby communities, recreation areas, lightning, corona effect on communication sites, stray and induced voltage, noise, fire, and the health and safety of maintenance workers. Through the implementation of design features and the limited number of sensitive receptors adjacent to the reference line, minimal to no impacts to public health are anticipated. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.19 Wild Horses

There are 10 wild horse herd management areas (HMAs)/herd areas (HAs) located within the analysis area. During periodic wild horse roundups, BLM uses helicopters within the HMAs/HAs to assist in directing the horses into the designated collection areas. Due to the necessary use of helicopters, BLM prefers to locate transmission lines within HMAs/HAs parallel to existing transmission lines when feasible. In general, impacts to wild horses and HMAs would result from noise and increased human activity during installation of the transmission line poles, clearing and grading existing and new access roads, vehicle operation in areas where overland vehicle travel would occur, and use of temporary laydown areas. Construction activities and operation of the transmission line could impact the ability of the BLM to conduct future wild horse gathers in and near the transmission line area. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

ES.3.20 Lands with Wilderness Characteristics

There are 49 units of lands with wilderness characteristics (LWCs) within the analysis area. While all 49 units meet the criteria for LWCs, only 1 LWC unit (Mexican Mountain, within the Price FO) has approved RMP decisions that intend to manage these units as natural areas to protect, preserve, and maintain wilderness characteristics. Eleven units within the Vernal, Moab, and Price FOs were evaluated in an RMP process, but determined to not manage these areas for their wilderness characteristics. The remaining 37 units shown have not been formally evaluated in an RMP process for appropriate management decisions for wilderness characteristics.

Inventory units that are determined to meet criteria for LWC could be intersected or include built portions of the proposed Project and, as a result, some remaining portions may no longer meet the criteria for size (greater than 5,000 acres), naturalness, or solitude. Within Region I, portions of up to 8 LWC units could be eliminated for LWC consideration by the proposed action or its alternatives. Within Region II, portions of up to 8 LWC units could be eliminated for LWC consideration by the proposed action or its alternatives. Within Region III, portions of up to 9 LWC units could be eliminated for LWC consideration by the proposed action or its alternatives. There are no LWC units within Region IV. Impacts by region and alternative are shown in **Tables 2-23** through **2-26**.

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Abbreviations and Acronyms

$\mu g/m^3$	micrograms per cubic meter
AASHTO	American Association of State Highway and Transportation Officials
AC	alternating current
ACEC	area of critical environmental concern
ACHP	Advisory Council on Historic Preservation
AFB	Air Force Base
AGL	above ground level
AML	appropriate management level
amsl	above mean sea level
Applicant	TransWest Express LLC
AQRV	air quality related value
ATV	all-terrain vehicle
AU	analysis unit
AUM	animal unit month
AWBP	Aransas-Wood Buffalo National Park
AWEA	American Wind Energy Association
BA	biological assessment
BCHA	Bird Habitat Conservation Area
BE	biological evaluation
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
BO	biological opinion
CAA	Clean Air Act

CDA	Colorado Department of Agriculture
CDNST	Continental Divide National Scenic Trail
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMP	Comprehensive Management Plan
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COM Plan	Construction, Operation, and Maintenance Plan
CPW	Colorado Parks and Wildlife
CTC	centralized traffic control
CWA	Clean Water Act
CWMU	cooperative wildlife management unit
DC	direct current
DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
DRUA	Dispersed Use Recreation Area
dv	deciview
ECM	Environmental Compliance Monitors
EDRR	Early Detection Rapid Response
EHV	extra-high voltage
EIS	environmental impact statement
EMF	electric and magnetic field

ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FLM	Federal Land Manager
FLPMA	Federal Land Policy and Management Act of 1976
FO	field office
FR	Federal Register
g	gravity
GHG	greenhouse gas
GIS	geographic information system
GSM	General Soil Map
GWh/yr	gigawatt hours per year
HA	herd area
HAP	hazardous air pollutant
HMA	herd management area
Hoover Act	Hoover Power Plant Act of 1984
HUC	Hydrographic Unit Code
I-15	Interstate 15
I-70	Interstate 70
I-80	Interstate 80
IBA	Important Bird Area
ID	Interdisciplinary
IM	Instruction Memoranda
IPCC	Intergovernmental Panel on Climate Change
IPP	Intermountain Power Project

IR	Impaired Waters Assessment Report
IRA	inventoried roadless area
ISA	Instant Study Area
km	kilometer
KOP	key observation point
kV	kilovolt
kWh	kilowatt-hour
LADWP	Los Angeles Department of Water and Power
LATN	Low Altitude Tactical Navigation
LCCRDA	Lincoln County Conservation, Recreation, and Development Act
LRMP	Land Resource Management Plan
LRP	limited revegetation potential
LWC	Lands with Wilderness Characteristics
MBTA	Migratory Bird Treaty Act
MFP	management framework plan
$MgCl_2$	magnesium chloride
MIS	management indicator species
MLRA	Major Land Resource Area
MOA	Military Operations Areas
MOU	Memorandum of Understanding
MTR	military training route
Mw	moment magnitude
MW	megawatt
MWh	megawatt hour
NAAQS	National Ambient Air Quality Standards
NCA	National Conservation Area
NDOT	Nevada Department of Transportation

NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NFMA	National Forest Management Act
NFS	National Forest System
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NNL	National Natural Landmark
NOAA	National Oceanographic and Atmospheric Administration
NO_2	nitrogen dioxide
NOI	Notice of Intent
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	National Recreation Area
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NST	National Scenic Trail
NTTG	Northern Tier Transmission Group
NTTR	Nevada Test and Training Range
NVUM	national visitor use monitoring
NWR	National Wildlife Refuge
NWSRS	National Wild and Scenic River System
OHV	off-highway vehicle

ORV	off-road vehicle
PA	Programmatic Agreement
PDTR	Project Description Technical Report
PFYC	Potential Fossil Yield Classification
PGA	peak ground acceleration
P.L.	Public Law
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 microns or less
PM_{10}	particulate matter with an aerodynamic diameter of 10 microns or less
POD	Plan of Development
Project	TransWest Express Transmission Project
ppb	parts per billion
ppm	parts per million
ppmw	parts per million by weight
RA	Recreation Area
Recovery Act	American Recovery and Reinvestment Act of 2009
RFFA	reasonably foreseeable future action
RHA	Rivers and Harbors Act
RMP	Resource Management Plan
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
RPPR	Regional Project Planning Review
RRTT	Rapid Response Team for Transmission
SAR	Small Arms Range
SCD	soil conservation district
SDA	special designation area

SEO	State Engineer's Office
SEZ	Solar Energy Zones
SHPO	State Historic Preservation Office
SIO	Scenic Integrity Objective
SIP	State Implementation Plan
SMA	special management area
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SRMA	special recreation management area
STATSGO	State Soil Geographic
STS	Southern Transmission Systems
SSURGO	Soil Survey Geographic
SWA	state wildlife area
TAC	The Anschutz Corporation
TCP	traditional cultural property
TDS	total dissolved solid
TERP	Terminal Instrument Procedures
TIP	Transmission Infrastructure Program
TMDL	total maximum daily load
TransWest	TransWest Express LLC
TSP	total suspended particulate
TWE	TransWest Express
VRI	Visual Resource Inventory
VRM	Visual Resource Management
VQO	Visual Quality Objective
UDOGM	Utah Division of Oil, Gas, and Mining
UDOT	Utah Department of Transportation

UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
URMCC	Utah Reclamation Mitigation and Conservation Commission
URUD	unroaded/undeveloped
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
UTTR	Utah Test and Training Range
WBD	Water Boundary Dataset
WDOT	Wyoming Department of Transportation
Western	Western Area Power Administration
WECC	Western Electricity Coordinating Council
WGFD	Wyoming Game and Fish Department
WHMA	Wildlife Habitat Management Area
WRCC	Western Region Climate Center
WSA	wilderness study area
WSR	Wild and Scenic Rivers
WUS	Waters of the U.S.
WWEC	West-wide Energy Corridor

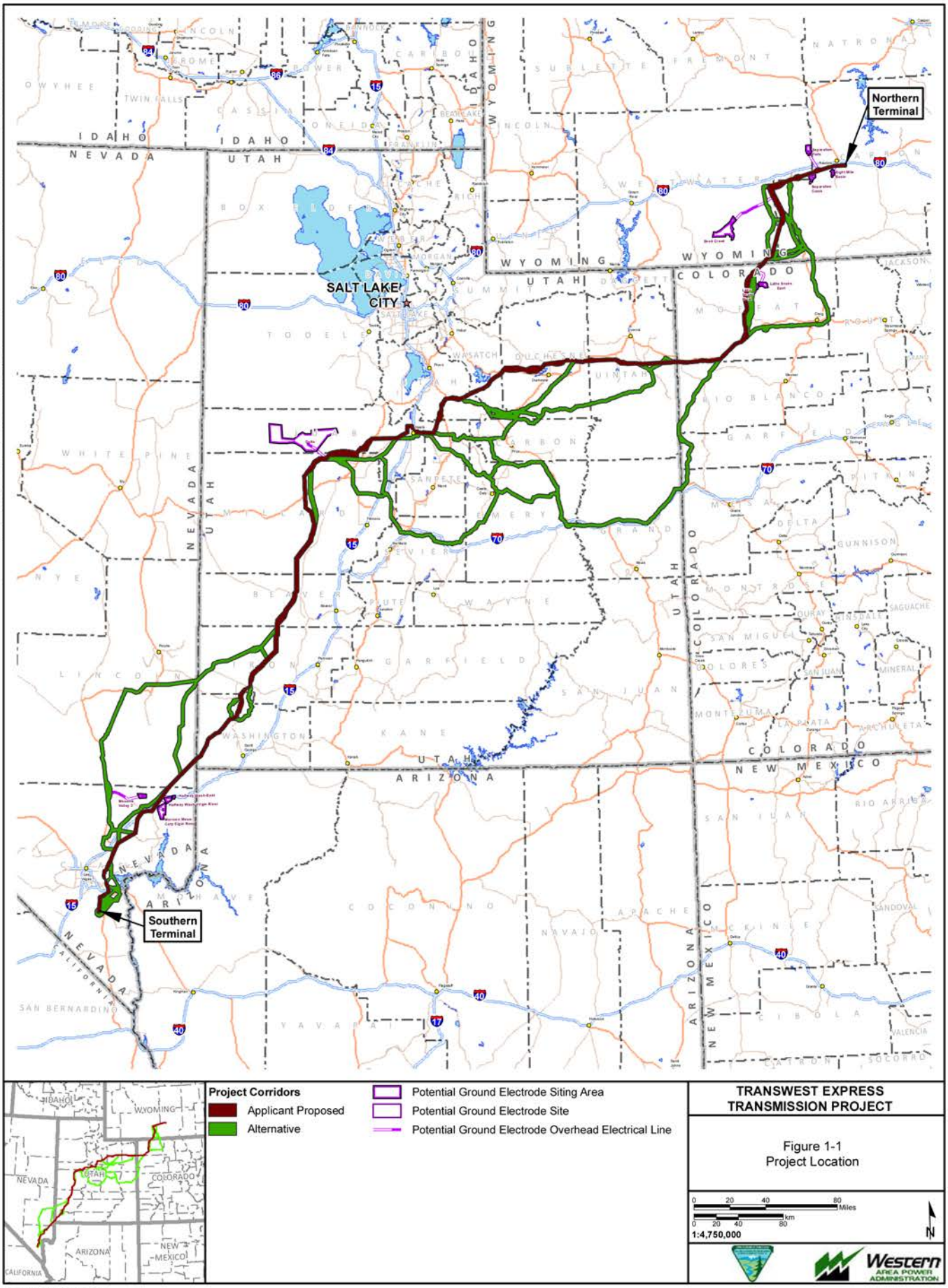
1.0 Introduction

The TransWest Express (TWE) Transmission Project (Project) is proposed as an extra high voltage (EHV), direct current (DC) transmission system extending from south-central Wyoming to southern Nevada (**Figure 1-1**). The proposed transmission line (and alternatives) cross four states (Wyoming, Colorado, Utah, and Nevada) encompassing lands owned or administered by the Bureau of Land Management (BLM), United States (U.S.) Forest Service (USFS), National Park Service (NPS), Bureau of Reclamation, Utah Reclamation Mitigation and Conservation Commission (URMCC), various state agencies, Native American tribes, municipalities, and private parties. The Project would provide the transmission infrastructure and capacity necessary to deliver approximately 3,000 megawatts (MW) of electric power from renewable and/or other non-renewable energy resources in south-central Wyoming to southern Nevada. One MW (or 1 million watts) of power can deliver approximately 6.5 million kilowatt-hours (kWh) of electricity in 1 year. An average U.S. household consumes about 10,655 kWh of electricity in a year. Therefore, 1 MW of power provides electricity for 610 households' annual use (American Wind Energy Association [AWEA] 2008). The Project would transmit power for over 1,800,000 households annually.

The TransWest Express LLC (TransWest/Applicant) proposed action would consist of an approximately 725-mile-long, 600-kilovolt (kV), DC transmission line and two terminals, each containing a converter station that converts alternating current (AC) to DC or vice-versa. The northern AC/DC converter station would be located near Sinclair, Wyoming, and the southern near the Marketplace Hub in the Eldorado Valley, approximately 25 miles south of Las Vegas, Nevada. The Project would retain an option for a future interconnection with the Intermountain Power Project (IPP) transmission system in Millard County, Utah. The Project has been divided geographically into four regions for analysis in this environmental impact statement (EIS). Each Project region contains a proposed route and two to four alternative routes that are analyzed in this EIS. The BLM has identified a preferred alternative within each of the four Project regions that would all combine to create a complete preferred alternative from Wyoming to Nevada. A more detailed description of the proposed and alternative routes, Project facilities and design, and construction schedule is presented in Chapter 2.0. Project operation, maintenance, and decommissioning also are considered.

The following describes the Project ownership, and the BLM right-of-way (ROW) application process.

- In November 2007, National Grid filed a ROW application with the BLM to construct and operate portions of an EHV transmission line between Wyoming and delivery points in the southwestern U.S.
- In 2008, The Anschutz Corporation (TAC) formed TransWest Express LLC, a wholly owned subsidiary of TAC, and acquired the Project from National Grid. In September 2008, National Grid and TransWest submitted an amended ROW application to the BLM requesting the assignment of the application and related project files to TransWest. As a result, TransWest became the project applicant.
- TransWest submitted an amended ROW application in December 2008 and again in January 2010 to reflect changes and refinements in the proposed Project. The application was assigned case file number WYW-177893.
- In April 2010, TransWest and Western Area Power Administration (Western), an agency of the U.S. Department of Energy (DOE), entered into a Memorandum of Understanding (MOU) in which Western agreed to act as joint lead agency with the BLM in the preparation of the EIS in accordance with the National Environmental Policy Act of 1969, as amended (NEPA). BLM's status as a joint lead agency was based on its potential federal action to grant a utility ROW across BLM lands. Western's status as a joint lead agency was based on its potential federal action to provide federal funds for the Project. Each of these decisions will be informed by the NEPA analysis contained in this EIS.


Northern Terminal
Southern Terminal
SALT LAKE CITY
IDAHO
NEVADA
UTAH
WYOMING
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridors
Applicant Proposed
Alternative
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 1-1
Project Location
Miles
km
1:4,750,000
Western AREA POWER ADMINISTRATION
Exported On: 6/5/2013
X:\0Projects\12907_003_Transwest_Express\Figures\Document Figures\2013_DEIS_v3\ProjLoc\Fig_01_01_ProjLoc.mxd

- On September 9, 2011, Western and TransWest executed a Development Agreement in which the entities agreed to jointly fund the development phase of the Project, each responsible for 50 percent of the development costs if Western decides to participate in the Project. Under this Agreement, Western could acquire a 50 percent joint ownership in the Project. As with BLM's decision on whether to grant a ROW for the project, Western's decision on whether to invest federal funds into the development and future phases of this Project will be informed by the results of this NEPA analysis.

To ensure it meets NEPA disclosure requirements, this EIS has been prepared in compliance with the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations [CFR] 1500). The BLM Wyoming State Office and Western have been designated as joint lead federal agencies for the NEPA process, and are mutually overseeing the preparation of the EIS. Accordingly, this EIS also conforms to both the BLM's and Western's requirements for NEPA implementation as described in the BLM NEPA Handbook (H-1790-1) and the DOE's NEPA Implementing Procedures (10 CFR 1021), respectively. However, depending on the chosen alternative, this Project potentially would cross other federal lands. Accordingly, project implementation would require other federal agencies to make decisions related to granting ROWs. The BLM has included those agencies, as well as non-federal agencies and/or municipalities with jurisdictional authority or special expertise with respect to resource issues addressed by the NEPA analysis as cooperating agencies in this EIS process. The cooperating agency relationship ensures that the BLM engages and considers comments of these agencies when making Project decisions and includes information required to satisfy the environmental and public review processes associated with those decisions. The cooperating agencies are responsible for assisting the BLM with identifying issues to be addressed, providing associated data or feedback, development of alternatives, and for review and feedback on the NEPA document. As part of the process for satisfying these requirements, this Draft EIS analyzes the environmental impacts of construction, operation, and maintenance of the transmission system on all lands crossed by the Project. While the EIS contains sufficient information to allow the BLM and Western to choose among alternatives, in some instances, cooperating agencies may require additional information before making decisions related to specific lands within their jurisdiction. The general steps in the EIS process are illustrated on **Figure 1-2**.

1.1 Lead Federal Agencies' Purpose and Need, and Decisions

The lead federal agencies' purpose and need for the major federal actions for the proposed Project are described below.

1.1.1 BLM's Purpose and Need

In accordance with the Federal Land Policy and Management Act of 1976 (FLPMA) (Section 103(c)), public lands are to be managed for multiple use that takes into account the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Interior is authorized to grant ROWs on public lands for systems of generation, transmission, and distribution of electric energy (Section 501(a)(4)).

The purpose of the BLM's federal action is to respond to TransWest's application for a ROW to construct, operate, maintain, and decommission a transmission line on public lands. The need for this action is to fulfill BLM's responsibility under FLPMA and BLM ROW regulations to manage the public lands for multiple uses, including transmission of electric energy (43 CFR 2806). To advance these objectives, BLM designates utility corridors through BLM lands and endeavors to co-locate large, linear facilities such as transmission lines within those corridors, thereby avoiding the proliferation of new routes through sensitive lands and wildlife habitats (43 United States Code [U.S.C.] 1763). These designated corridors conform with long-range corridor needs established by the DOE under Section 368 of the Energy Policy Act and correlate with designated corridors on adjoining public lands.

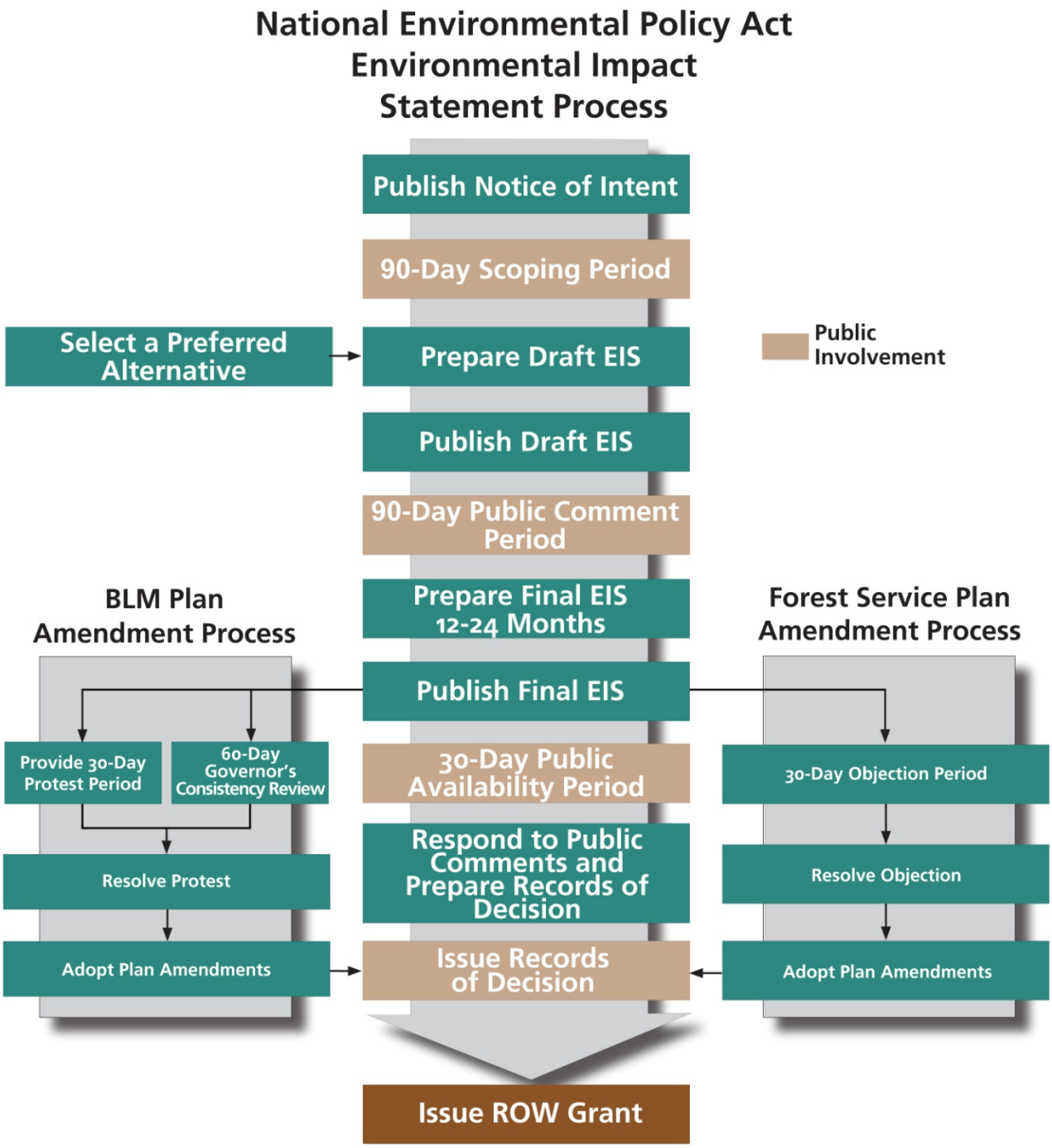


Figure 1-2 National Environmental Policy Act Environmental Impact Statement Process

The agencies' purpose and need is further guided by the Energy Policy Act of 2005, which recognized the need to improve domestic energy production, develop renewable energy resources, and enhance the infrastructure (e.g., transmission lines) for collection and distribution of energy resources across the nation. To this end, the BLM and USFS are charged with analyzing applications of utility and transportation systems on federal lands they administer. When analyzing applications, the agencies' also must consider the recommendations in the 2011 Western Electricity Coordinating Council (WECC) 10-Year Regional Transmission Plan regarding future transmission needs (WECC 2011).

1.1.1.1 BLM's Decisions

The BLM must review and authorize each component of the project that involves the use of public lands (e.g., construction staging/storage areas, access roads, the transmission line towers and conductors, and other ancillary facilities). This use would be authorized by a ROW grant supported by the environmental record. When a ROW grant is offered, a Record of Decision (ROD) documents the BLM's decision and its rationale for the route authorized, adopts construction and mitigation measures proposed by the Proponent (usually contained in the Proponent's Plan of Development [POD]), and adds terms and conditions deemed necessary by the BLM to provide resource protection not included in the Proponent's Proposal. The BLM decisions to be made are to:

- Decide whether to grant, grant with modification, or deny a ROW to construct, operate, and maintain the proposed facilities for a transmission line on public lands;
- Decide whether one or more BLM land use plans should be amended to allow the proposed transmission line;
- Determine the most appropriate location for the transmission line on public lands, considering multiple-use objectives; and
- Determine the terms and conditions (stipulations) for the construction, operation, maintenance, and decommissioning of the transmission line on public lands that should be applied to the ROW grant.

The BLM has prepared this EIS to disclose and analyze the potential direct, indirect, and cumulative impacts of the proposed action and alternatives, as required by NEPA, to facilitate public participation and to assist the BLM decision-maker in making the decisions listed above. The BLM Wyoming state director is the agency official who will be making the decisions in the ROD.

1.1.2 Western Area Power Administration's Purpose and Need

Western's purpose and need is to carry out Federal policy to facilitate renewable energy development and transmission expansion as established by the American Recovery and Reinvestment Act's 2009 amendment of the Hoover Power Plant Act of 1984 (P.L. 98-381, Title III, § 301) (Hoover Act). The amended Hoover Act provides Western the authority to borrow funds from the U.S. Treasury to construct, finance, facilitate, plan, operate, maintain, and/or study construction of new or upgraded electric power transmission lines and related facilities. These transmission lines and related facilities must have at least one terminus in Western's marketing area and deliver or facilitate the delivery of power from renewable resources constructed or reasonably expected to be constructed after the enactment of the amended Hoover Act.

1.1.2.1 Western Area Power Administration's Decision

Western's decision is whether it would use its borrowing authority to partially finance and hold partial ownership with TransWest in the resulting transmission facilities and capacity. Specifically, funding would be used to construct, operate, maintain, and decommission a transmission line. This decision would be managed through agreements that would include defining the respective rights and obligations associated with ownership of the Project; address construction, operation, and maintenance associated with the transmission line; and provide for acquisition of ROWs for the Project.

Prior to committing funds for construction, Western must certify that a project is in the public interest; a project will not adversely impact system reliability, system operations, or other statutory obligations; and it is reasonable to expect the proceeds from the project will be adequate to make repayment of the loan from Treasury. In addition, the Project will need to satisfy the requirements of Western's Transmission Infrastructure Program (TIP) and its authority under the Hoover Act. As with BLM's decision, Western's decision is informed by the required NEPA analysis and disclosure in this EIS.

1.2 Cooperating Agencies

The CEQ regulations implementing NEPA allow the lead agencies to invite other federal, state, tribal, or local agencies to serve as cooperating agencies in preparing the EIS (40 CFR 1501.6). A cooperating agency must hold legal jurisdiction over resources that could be impacted by the project, or provide special expertise with respect to resource issues addressed by the NEPA analysis. In addition, a MOU generally is implemented between the lead agencies and each cooperating agency.

Forty-two cooperating agencies have signed a MOU for the Project. These agencies are listed in **Table 1-1**.

Table 1-1 Project Cooperating Agencies

Federal	
USFS, Intermountain Region, Ogden, Utah representing: - Ashley National Forest - Dixie National Forest - Fishlake National Forest - Manti-La Sal National Forest - Uinta-Wasatch-Cache National Forest[1]	
U.S. Fish and Wildlife Service (USFWS) representing: - Mountain Prairie Region, Lakewood, Colorado - Pacific Southwest Region, Sacramento, California	
NPS - Intermountain Region, Lakewood, Colorado - Pacific West Region, San Francisco, California	
U.S. Army Corps of Engineers (USACE) - South Pacific Division - Northwestern Division	
U.S. Army Region 8	
Navy Region Southwest, San Diego, California	
Bureau of Reclamation, Lower Colorado Region	
Bureau of Indian Affairs (BIA) Western Region, representing: - Rocky Mountain Region, Billings, Montana - Southwest Region, Albuquerque, New Mexico	
Utah Reclamation Mitigation and Conservation Commission	
State	
State of Wyoming	State of Colorado
State of Utah	State of Nevada

Table 1-1 Project Cooperating Agencies

County	
Wyoming: Carbon, Sweetwater	
Colorado: Garfield, Mesa, Moffat, Rio Blanco	
Utah: Beaver, Carbon, Daggett, Duchesne, Emery, Grand, Iron, Millard, Juab, Piute, Sanpete, Sevier, Uintah, Utah, Wasatch, Washington	
Nevada: Clark, Lincoln	
Other	
Little Snake River Conservation District	Saratoga-Encampment-Rawlins Conservation District
Medicine Bow Conservation District	Sweetwater County Conservation District
Douglas Creek Conservation District	White River Conservation District
N-4 State Grazing Board	

[1] In March of 2008, the Uinta National Forest and the Wasatch-Cache National Forest were combined into one administrative unit (Uinta-Wasatch-Cache National Forest). Each of these forests continues to operate under individual forest plans approved in 2003. When the term Uinta National Forest is used, it refers to the Uinta Planning Area of the Uinta-Wasatch-Cache National Forest.

1.3 TransWest's Goals and Objectives

TransWest's primary goal is to provide the transmission infrastructure and capacity necessary to reliably and cost-effectively transmit up to 3,000 MW of electric power from Wyoming to the desert southwest. TransWest's objectives for the Project are to:

- Allow consumers access to renewable energy sources and contribute to meeting national, regional, and state energy and environmental policies, including state-mandated renewable energy portfolio and greenhouse gas reduction targets;
- Meet increasing customer demand with improved electrical system reliability;
- Allow consumers access to domestic energy sources and contribute to complying with national energy policy;
- Provide system flexibility and increased access to the grid for third-party transmission users;
- Expand regional economic development through increased employment and enlargement of the property tax base; and
- Maintain the standard of living associated with highly reliable electricity service.

While meeting these broad objectives, TransWest would work within the following Project-specific objectives:

- Provide for the efficient, cost-effective, and economically feasible transmission of approximately 20,000 gigawatt hours per year (GWh/year) of clean and sustainable electric energy from Wyoming to markets in the desert southwest region. This estimate is based on 8,760 hours per year of 3,000-MW transmission capacity.
- Meet North American Electric Reliability Corporation (NERC) Reliability Standards and WECC planning criteria and line separation requirements.
- Maximize the use of existing and designated utility corridors and access roads to the extent practical to minimize adverse effects of the Project.
- Provide these benefits in a timely manner to the desert southwest region and the broader Western U.S. to meet the region's pressing environmental and energy needs. TransWest has identified a need

for the Project by the expected in-service date of 2015 or as soon as the regulatory reviews can be completed.

- Provide for flexibility and maximize the use of infrastructure to increase future transmission capacity by configuring the Project to allow for future interconnection with the IPP transmission system near Delta, Utah.

1.4 Relationship to Programs, Policies, and Plans

1.4.1 Federal Multi-agency Programs

The West-wide Energy Corridor (WWEC) Programmatic EIS was prepared jointly by the U.S. Department of the Interior (DOI) and the DOE for energy corridors in 11 western states and completed in January 2009. The RODs for the WWEC Programmatic EIS designated energy transmission corridors and provided guidance, best management practices (BMPs), and mitigation measures to be used for any power lines proposed to be constructed within the corridors on public lands. The Programmatic EIS provides a framework (further described in Chapter 2.0) for the development of Project alternatives. The analysis in this EIS refers to the analysis from the WWEC Programmatic EIS, to the extent applicable, and incorporates by reference all BMPs and mitigation measures in the RODs for the WWEC Programmatic EIS.

In October of 2009, nine federal entities including the CEQ, the USDI, the U.S. Department of Agriculture (USDA), the DOE, the Department of Commerce, the Department of Defense (DOD), the U.S. Environmental Protection Agency (USEPA), the Federal Energy Regulatory Commission (FERC), and the Advisory Council on Historic Preservation (ACHP) signed a MOU committing each of the signatories to increase their coordination to expedite and simplify the process for analyzing, permitting, and building transmission lines on federal lands.

On October 5, 2011, the Obama Administration announced the formation of a Rapid Response Team for Transmission (RRTT) comprised of the nine agencies who signed the MOU. This team was formed to more quickly advance the permitting for seven pilot transmission projects, including this Project.

The RRTT mission (CEQ 2011) is to “accelerate responsible and informed deployment of these seven key transmission facilities by:

- Coordinating statutory permitting, review, and consultation schedules and processes among involved federal and state agencies as appropriate through Integrated Federal Planning,
- Applying a uniform and consistent approach to consultations with Tribal governments, and,
- Expeditiously resolving interagency conflicts and ensuring that all involved agencies are fully engaged and meeting schedules.”

1.4.2 Federal Agency Roles, Requirements, and Decisions

The following sections briefly describe the roles, policies, plans, programs, and decisions of the federal lead agencies and those agencies whose jurisdictional lands may be requested for Project facilities. Also included are the federal agencies that must consult with the lead agencies, or review and approve applications for certain activities.

The level of involvement by various federal agencies in EIS decisions largely depends on whether lands and resources under agency jurisdiction would be directly or indirectly affected by project facility construction, operation, and decommission. **Table 1-2** provides miles of potential transmission line ROW that would be required for the Project and Project alternatives in the various federal jurisdictions.

Table 1-2 Miles of Proposed Project Transmission Line ROW by Jurisdiction

Federal Agency	Proposed Action (Miles)	All Alternatives (Miles)
USDI – BLM	447	872
USDI – Bureau of Reclamation	7	6
USDI – BIA/Tribal	0	24
USDI – NPS	0	22
USDA – FS (USFS)	39	176
DOE	0	3
URMCC	1	0
State – Wyoming, Colorado, Utah, and Nevada	43	192
Private	188	611
Total	**725**	**1,907**

Figure 1-2 provides the steps in the EIS process and shows how BLM Resource Management Plan (RMP) and USFS Land and Resource Management Plan (LRMP) amendments would fit in to the process. The plan amendment process for these two agencies is described briefly below and discussed in detail in Chapter 4.0.

1.4.2.1 Bureau of Land Management

The BLM is a joint lead federal agency for the Project, along with Western. The technical guidance and guidance documents used for EIS preparation include: 1) the CEQ implementing regulations for NEPA (40 CFR 1500-1508); 2) the BLM NEPA Handbook (H-1790-1); 3) the USDI NEPA regulations (43 CFR 46); 4) the BLM Planning Regulations (43 CFR 1601 and 1610); 5) the BLM Land Use Planning Handbook (H-1601-1); 6) relevant BLM Instruction Memoranda (IM), including IM Nos. 2011-059, 2011-060, and 2011-061; 7) the RMPs for the individual BLM field offices (FOs); and 8) the proponents' POD and Project Description Technical Report (PDTR), which describe how and where the Project would be constructed. **Table 1-3** lists the BLM FOs potentially crossed by the Project and their pertinent RMPs.

Table 1-3 Current BLM Resource Management Plans Relevant to the Project

State	Field Office	Current RMP
Colorado	Grand Junction	Grand Junction Resource Area RMP, January 1987.
Colorado	Little Snake	Little Snake FO RMP, October 2011.
Colorado	White River	White River FO RMP, July 1997.
Nevada	Caliente	Ely District RMP, August 2008.
Nevada	Las Vegas	Las Vegas FO RMP, October 1998.
Nevada	Las Vegas	Las Vegas FO RMP Approved ROD Maintenance Record, January 2007.
Utah	Cedar City	Pinyon Management Framework Plan (MFP), June 1983.
Utah	Cedar City	Cedar Beaver Garfield Antimony Planning Area RMP, October 1986.
Utah	Fillmore	Warm Springs Resource Area RMP, April 1987.
Utah	Fillmore	House Range Resource Area RMP, October 1987.
Utah	Moab	Moab FO RMP, October 2008.

Table 1-3 Current BLM Resource Management Plans Relevant to the Project

State	Field Office	Current RMP
Utah	Price	Price FO RMP, October 2008.
Utah	Richfield	Richfield FO RMP, October 2008.
Utah	Saint George	Saint George FO RMP, March 1999.
Utah	Salt Lake	Pony Express Resource Area RMP and Rangeland Program Summary for Utah County, January 1990.
Utah	Vernal	Vernal FO RMP, October 2008.
Wyoming	Rock Springs	Green River Resource Area RMP, August 1997.
Wyoming	Rawlins	Rawlins FO RMP, December 2008.

Actions that result in a change in the scope of resource uses, terms, conditions, and decisions of federal agency land use plans, including the approval of this proposal, may require amendment of one or more of the plans in **Table 1-3**. As required by 43 CFR 1610.2(c), the BLM notified the public of potential amendments to RMPs in the Notice of Intent (NOI) to Prepare an EIS (see *Federal Register*, Volume 76, No. 2, Tuesday, January 4, 2011). All authorizations and actions proposed for approval in the EIS would be evaluated to determine if they conform to the decisions in the referenced land use plans. If the BLM determines that plan amendments are necessary, compliance with NEPA for any land use plan amendments would occur simultaneously with the consideration of the Project as described in 43 CFR 1610. Refer to Chapter 4.0 for additional details regarding the need for plan amendments and how they may relate to the Project.

As illustrated in **Figure 1-2,** the proposed BLM plan amendments would be included in the Final EIS and would then be subject to a 30-day protest period, a 60-day Governor's consistency review, and a resolution of protests. The BLM may adopt the plan amendments after this public review, and attach the adoption decisions to the ROD.

The Project authorization decisions would be documented in the Project ROD prepared by the BLM. The BLM would consider the decisions of other federal land management agencies that are required for the Project before issuing or denying the Project ROW (43 CFR 2882.2).

Under the authority granted by the FLPMA (43 U.S.C. 1701), the BLM would issue ROW grants for BLM-administered lands crossed by the proposed Project.

1.4.2.2 Western Area Power Administration

As a joint lead federal agency along with the BLM, Western is assisting with preparation and review of the EIS. Under the Hoover Act, as amended by Section 402 of the Recovery Act, Western was granted authority to borrow funds from the U.S. Treasury to (among other things) construct, finance, facilitate, plan, operate, maintain, and/or study construction of new or upgraded transmission facilities that deliver renewable energy. Prior to committing funds, Western must certify that a project is in the public interest; a project will not adversely impact system reliability, system operations, or other statutory obligations; and it is reasonable to expect the proceeds from the project will be adequate to make repayment of the loan.

On March 4, 2009, Western solicited interest in proposed transmission projects that resulted in the submission of Statements of Interest, including one for this Project.

Western is considering whether to participate in the Project as a joint owner with TransWest as part of Western's TIP. For Western to participate, Western needs the Project to satisfy Western's TIP requirements.

As with the BLM's decision, Western's decision is informed by the required NEPA analysis and disclosure in this EIS.

1.4.2.3 Bureau of Reclamation

The Bureau of Reclamation is a cooperating agency on the Project. Project facilities could be located on Bureau of Reclamation lands in the vicinity of Lake Mead in southern Nevada. The Bureau of Reclamation would issue the Right of Use Authorization for any transmission facilities to be located on Bureau of Reclamation lands and a separate ROD that would outline the Bureau of Reclamation's decision and the terms and conditions under which the Right of Use Authorization would be granted.

1.4.2.4 Bureau of Indian Affairs

As a cooperating agency, the BIA would participate in the development of the EIS. If portions of the Project would be located on tribal lands, the BIA also would prepare a ROD and ROW grant for tribal lands. Tribal lands are crossed by alternatives in Uintah and Duchesne counties, Utah (Uintah and Ouray Indian Reservation), and in Clark County, Nevada (Moapa Indian Reservation). It should be noted that, although one of the alternative routes crosses the Moapa Indian Reservation in southern Nevada, the utility corridor within which the alternative would be located is administered by the BLM; therefore, no additional BIA approval would be required if the alternative route remains within the designated BLM-administered utility corridor through the Moapa Indian Reservation.

1.4.2.5 National Park Service

The NPS is a cooperating agency on the Project. The Project transmission line corridor alternatives contain a small portion of Dinosaur National Monument lands at the eastern end of the Deerlodge access road approximately 12 miles from the Dinosaur National Monument proper. Consideration of a ROW across the Deerlodge road lands is included in the EIS because of land use and other resource constraints in the area. Because no application has been received by the NPS from TransWest to date for this alternative, no potential NPS plan amendments have been identified.

Project transmission line corridor alternatives have been developed across portions of the Lake Mead National Recreation Area (NRA) administered by the NPS because of limited available width within an existing utility corridor within the Sunrise Mountain Instant Study Area (ISA) established by Congress. The current Lake Mead NRA Management Plan would not allow construction and operation of the Project. As a consequence, the Lake Mead Management Plan could require amendment to open new utility corridors to accommodate the Project. NPS policy directs the use of authority under 16 U.S.C. 79 for electric transmission ROWs, which typically limits authorizations to 100-foot-wide ROWs. Deviation from NPS guidance on the application of 16 U.S.C. 79 to electric transmission line approvals likely would require a policy waiver from the NPS.

1.4.2.6 U.S. Forest Service

The USFS is a cooperating agency on the Project. The proposed Project and alternative corridors being analyzed would cross USFS lands under the jurisdiction of up to five different national forests. The National Forest Management Act (NFMA) (16 U.S.C. 1601-1614) requires the Secretary of Agriculture to develop and revise LRMPs for lands under its jurisdiction.

LRMPs provide direction, goals, and criteria for management, including standards and guidelines for resource use and land management practices. **Table 1-4** lists the national forests potentially crossed by the Project and their pertinent LRMPs.

Table 1-4 Current USFS Land and Resource Management Plans Relevant to the Project

State	National Forest	Current LRMP
Utah	Ashley	LRMP for the Ashley National Forest, October 1986
Utah	Dixie	LRMP for the Dixie National Forest, September 1986
Utah	Fishlake	LRMP for the Fishlake National Forest, June 1986
Utah	Manti-La Sal	LRMP Manti-La Sal National Forest, November 1986
Utah	Uinta	LRMP Uinta National Forest, May 2003

According to the NFMA (16 U.S.C. 1604(f)(4)) and its implementing regulations, all actions authorized subsequent to the plan must be in conformance with the approved LRMP. An action must be clearly consistent with decisions of the LRMP to be in conformance. To be clearly consistent, an action must comply with: 1) all stipulations, constraints, standards, and guidelines listed in a LRMP; and 2) all stipulations developed specifically for the proposed Project for the purpose of avoiding or reducing impacts on sensitive resources identified in the LRMP.

Under the NFMA, LRMPs may be amended after final adoption. The NFMA regulations at 36 CFR 219.10(f) state: "Based on an analysis of the objectives, guidelines, and other contents of the forest plan, the Forest Supervisor shall determine whether a proposed amendment would result in a significant change in the plan." The Forest Service Land and Resource Management Planning Handbook (Forest Service Handbook 1909.12) provides a framework for consideration. Section 5.32 of the Forest Service Handbook lists four factors to be used when determining whether a proposed change to a LRMP is significant or not significant. These significance factors include timing; location and size; goals, objectives, and outputs; and management prescriptions. The resulting findings are based on relevant information and documented in the USFS ROD. As illustrated on **Figure 1-2**, the USFS plan amendment approval process is conducted in conjunction with the development of the special use permit, requires a 30-day objection period, and requires a resolution of objections.

On January 12, 2001, the USFS published the Roadless Conservation Final Rule in the *Federal Register* (*Federal Register* 66 (9): 3243-3273), including the text of the Final Rule, and the reasons for its adoption. The Final Rule describes USFS policy concerning roadless areas throughout the National Forest System (NFS) and specifies that constructing new access roads or reconstructing existing unclassified roads that cross inventoried roadless areas (IRAs) would not be allowed (unless approved under specific exceptions). The Final Rule was implemented on May 12, 2001, and has been recently affirmed. On October 21, 2011, the U.S. Court of Appeals for the Tenth Circuit decided *Wyoming v. USDA* and found the USFS's adoption of the 2001 Roadless Area Conservation Rule does not violate federal law.

The USFS would require preparation of a Biological Evaluation (BE) for the Project. USFS policy (FSM 2670.32) states that all programs and activities would be reviewed in a BE as part of the NEPA process to determine the potential effect of such proposed activities on regional forester-designated sensitive species. Further, it is policy to avoid or minimize impacts to species whose viability has been identified as a concern, and permitted activities must not result in loss of species viability or create significant trends toward federal listing. The objectives of this policy are to ensure that species do not become endangered or threatened because of USFS actions, and that viable populations of all native and desired nonnative wildlife, fish, and plant species are maintained in habitats distributed throughout their geographic range on USFS lands (FSM 2670.22).

The USFS decision maker, in consultation with affected forests, would use this EIS to inform his/her decision regarding: 1) the choice of a preferred alternative; 2) whether to issue a Special Use Authorization under the NFMA; 3) under what terms and conditions a permit should be issued; and 4) the need to amend LRMPs.

1.4.2.7 U.S. Fish and Wildlife Service

The USFWS is a cooperating agency on the Project. The USFWS is responsible for ensuring compliance with the Endangered Species Act (ESA), the Bald and Golden Eagle Protection Act (BGEPA), and the Migratory Bird Treaty Act (MBTA). The BLM, as the lead federal agency for ESA Section 7 consultation, is responsible for initiating informal consultation (e.g., communication) with the USFWS to determine the likelihood of effects on listed species. In accordance with the ESA, formal consultation (as described below) with the USFWS is required when the action agency determines that a project may affect a listed species or designated critical habitat. The consultation process determines if a project is likely to jeopardize the continued existence of a species, or destroy or adversely modify critical habitat. Formal consultation begins with the BLM's written request for consultation and the submittal of a Biological Assessment (BA) and concludes with the issuance of a Biological Opinion (BO) from the USFWS. The BLM has entered into informal consultation with the USFWS for the Project.

The BLM will prepare a draft BA to assess potential impacts on federally listed species and their habitats from the agency preferred alternative. The draft BA would be submitted to the USFWS for review and concurrence. The USFWS would issue a letter of concurrence on the BA, or a BO, depending on the level of effects on listed species.

1.4.2.8 Advisory Council on Historic Preservation

ACHP oversees implementation of Section 106 of the National Historic Preservation Act (NHPA), which requires the lead federal agencies to consider the effects of the agencies' undertakings on properties listed in or eligible for the National Register of Historic Places (NRHP). NRHP properties can include a diversity of archaeological, historical, and traditional cultural properties. Regulations for Protection of Historic Properties (36 CFR 800) implement Section 106, and define a process for federal agencies to consult with the State Historic Preservation Office (SHPO) and other interested parties as they assess the effects of their undertakings. Pursuant to these regulations, the BLM has initiated Section 106 consultation with the Wyoming, Colorado, Utah, and Nevada SHPOs.

A Programmatic Agreement (PA) currently is being prepared for the Project. The PA is a document that records the terms and conditions agreed upon to resolve potential effects to historic properties of a federal agency program or complex undertaking in accordance with Section 106 of the NHPA. The PA for this Project defines the general and specific measures that would be undertaken by BLM, Western, TransWest, and the SHPOs to ensure Western's and BLM's objectives and responsibilities regarding protection of historic properties under the NHPA are fulfilled. Primary signatories for the PA include the BLM, Western, the USFS, TransWest, the SHPOs, and the ACHP. Those tribes whose lands would be crossed by the selected transmission line route also would be invited to sign the PA.

1.4.2.9 U.S. Army Corps of Engineers

The USACE is a cooperating agency on the Project. Section 404 of the Clean Water Act (CWA) establishes a permit program administered by the USACE to regulate the discharge of dredge and fill materials into the waters of the U.S. (WUS), including their adjacent wetlands. The Project would be under the jurisdiction of the Omaha, Sacramento, and Los Angeles districts of the USACE. The Applicant would be responsible for conducting wetland delineations for the proposed routes and filing the Section 404 application(s) and other CWA certifications.

Section 10 of the Rivers and Harbors Act (RHA) establishes a permit program to prevent unauthorized obstruction or alteration of any navigable WUS by construction in, over, or under said waters. Section 10 also

is administered by the USACE. The Applicant would be responsible for filing Section 10 permit application(s) for crossings at navigable waters.

1.5 Additional Governmental Requirements

Table A-1 in **Appendix A** provides a list of the major federal, state, and local permits and approvals that could be required for construction, operation, and maintenance of the Project.

1.6 Right-of-way Easement Acquisition Process on Non-Federal Lands

TransWest, or Western if they choose to participate in the proposed Project, would negotiate details regarding needed land acquisition across non-federal lands (e.g., private, county, state), either in fee or as an easement for the transmission line and associated facilities (substations, etc.), with each landowner. A private land easement, usually negotiated with the landowner, is the legal instrument that would be used to convey ROW to Western or TransWest. The easement would give TransWest or Western the right to operate and maintain the transmission line in the permanent ROW and, in return, would compensate the landowner for the use of the land.

The easement negotiations between TransWest or Western and the landowner could include compensation for loss of use during construction, loss of nonrenewable or other resources, and the restoration of unavoidable damage to property during construction. Although BLM does not enforce stipulations on private lands, Project implementation on these lands does have to comply with those regulatory requirements that also apply to private land (e.g., ESA, CWA). Thus, TransWest or Western and their contractors would be responsible for ensuring that the Project complies with these requirements. Additionally, private landowners may negotiate stipulations to address resource impacts as part of their agreements with TransWest or Western.

If a fee ownership or an easement cannot be negotiated with the landowner, federal and state laws allow in some cases for the acquisition of property rights for facilities to be built in the public interest. Western, as a federal agency investing in the Project, would have the ability to acquire the rights needed under eminent domain laws prevailing in the affected states. However, Western has committed to working with citizens and landowners to address any concerns regarding acquisition of any private lands required for Project implementation, should it decide to participate. Western views effective public involvement and engagement as a much more productive route than exercising eminent domain authority.

1.7 Scoping and Public Involvement

1.7.1 Public Scoping

The BLM and Western conducted pre-scoping activities in 2009 and Spring 2010 with the BLM FOs, USFS, and the cooperating agencies. Comments received during pre-scoping were considered in developing the alternative corridors presented to the public during the scoping period.

The NOI for the Project was published in the *Federal Register* on January 4, 2011. A Project newsletter was concurrently mailed to approximately 23,000 interested parties including federal, state, and local agencies; tribal governments; and potentially affected landowners within the proposed 2-mile transmission line corridors for the proposed and alternative routes. The BLM and Western placed display advertisements in local newspapers, and public service announcements were submitted for broadcast on local radio and television announcing the public scoping meetings. TransWest also conducted additional outreach related to the scoping process.

The BLM and Western held 23 public scoping meetings with a total attendance of 678 individuals. Dates and locations of the public meetings are provided in **Table 1-5**. All of the public scoping meetings were held from 4:00 p.m. to 7:00 p.m.

Table 1-5 Scoping Meetings

Vernal, Utah	January 25, 2011	St. George, Utah	February 17, 2011
Craig, Colorado	January 26, 2011	Pine Valley, Utah	February 22, 2011
Rangely, Colorado	January 27, 2011	Central, Utah	February 23, 2011
Grand Junction, Colorado	January 31, 2011	Enterprise, Utah	February 24, 2011
Moab, Utah	February 1, 2011	Caliente, Nevada	February 28, 2011
Castle Dale, Utah	February 2, 2011	Overton, Nevada	February 29, 2011
Duchesne, Utah	February 7, 2011	Henderson, Nevada	March 1, 2011
Nephi, Utah	February 8, 2011	Las Vegas, Nevada	March 2, 2011
Delta, Utah	February 9, 2011	Rawlins, Wyoming	March 8, 2011
Richfield, Utah	February 14, 2011	Rock Springs, Wyoming	March 9, 2011
Milford, Utah	February 15, 2011	Baggs, Wyoming	March 10, 2011
Cedar City, Utah	February 16, 2011		

The public meetings were conducted as open houses with seven information stations: Project Scope and Applicant's Interests and Objectives, NEPA and Agencies' Purpose and Need, Engineering/ Construction/Maintenance, Lands Acquisition, Map Book Table, GoogleEarth™ Demonstration, and Geographic Information System (GIS) Comment Station. Public scoping comments were electronically submitted at the GIS comment station at the meetings, through the BLM Project website, or by U.S. Mail.

During the scoping period, the BLM and Western met with representatives of several county commissions. The meetings were scheduled to coincide with the scoping meeting in their respective county. The meetings provided Project information and explained the EIS process. Packets containing the materials available to the public at the scoping meetings were distributed to the commissioners. In addition to the county commissioners, the BLM and Western met with the Clark County, Nevada, Conservation Program on March 1, 2011.

The BLM and Western received a total of 622 comment submittals (e.g., letter, comment form, email) containing 2,319 individual comments during the public scoping period. The public scoping comments were compiled in a database and analyzed for content. Reports were generated, categorizing the issues first by the Project region and then by resource and/or topic. The individual comments were keyed to a Project map for easy identification.

1.7.2 Consultation and Coordination with Federal, State, and Local Governments, and Federally Recognized Indian Tribes

The BLM and Western continue to participate in the coordination and consultation with federal, state, and local agencies, and tribal representatives about the potential for the proposed Project and alternatives to affect sensitive resources (40 CFR 1508.5; 1608.6; Forty Questions No. 14[a], 14[b], 14[c], and the CEQ Advisory Memorandum, *Designation of Non-Federal Agencies to be Cooperating Agencies in Implementing the Procedural Requirements of NEPA, July 1999*).

1.8 Issues to be Analyzed

After evaluating the comments received during the scoping, several key issues emerged. The issues were synthesized into topical areas that represent the most frequent public concerns about the proposed Project. These issues and topical areas defined the focus of the NEPA analyses disclosed in this EIS. A detailed summary of the scoping issues is contained in the Project Scoping Summary Report, which is posted on the BLM Wyoming State Office website: http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/transwest.html.

1.8.1 Corridor Alternatives

Most corridor-related comments were related to alternative locations. Concerns regarding particular corridor alternatives were related to avoidance of sensitive resources, including special status species habitat, impacts to visual resources, areas with special designations or management, and/or historic or cultural sites. Many of the commenters were landowners concerned about public health and safety issues and impacts to property values. A description of the pre-scoping corridor screening process is presented in **Appendix B**, TransWest Express Transmission Project Corridor Screening Report.

1.8.2 Potential Private and Public Land Use Conflicts

Conflicts with existing or potential future land uses were a common concern for many of the Project alternatives.

- Corridor alternatives located in Colorado potentially would conflict with private landowner properties, a new airport location, state land uses, and federal lands with special management designations.
- Corridor alternative concerns within Wyoming primarily were associated with impacts to agricultural lands, special status species, historic and cultural resources, and visual resources.
- In Utah, landowners in the Fruitland and Duchesne areas were concerned that the Project would conflict with agricultural activities and limit economic growth. Concerns about corridor alternatives were related to impacts to reservoirs in northern Utah, agriculture lands, Uinta/Ashley national forests, wilderness study areas (WSAs), and the Mountain Meadows National Historic Landmark (NHL) and Site.
- Numerous comments about conflicts with existing or potential future land uses came from the Las Vegas area, specifically north of Las Vegas (Apex) and the Henderson area.

1.8.3 Impacts to Fish, Wildlife, Vegetation, Special Status Species, and Habitat

Comments about potential impacts to greater sage-grouse were of high concern in Wyoming, Colorado, and Utah. Wildlife concerns in Wyoming and Colorado included impacts to big game migration and winter/spring range habitat for elk, mule deer, and pronghorn. There were numerous concerns regarding impacts to desert tortoise habitat in southern Utah and Nevada, as well as impacts to bighorn sheep where the proposed Project would traverse desert mountain ranges. Habitat loss for raptors and migratory bird species, as well as potential for increased bird collisions with transmission lines, were a concern throughout the analysis area.

1.8.4 Concerns about Wildlife Mitigation

Wildlife mitigation measures were important concerns, particularly in areas where the proposed corridor and alternative corridors potentially would affect special status species and wildlife. Many of the comments provided recommendations such as construction timing, buffer zones, perching deterrents, and mitigation plans. Compensatory mitigation for wildlife habitat loss also was recommended, particularly for impacts to migratory birds.

1.8.5 Noxious Weed Control and Reclamation

In nearly all scoping meeting locations, concerns were expressed about the potential for the spread of noxious and invasive weeds along new ROWs, and the need for appropriate control measures. Concerns and suggestions were expressed regarding the choice of appropriate seed mixtures for surface disturbance reclamation, especially as related to benefits to wildlife and livestock grazing.

1.8.6 Public Health and Safety

Numerous comments about public health and safety were received from areas where the proposed Project would cross or be adjacent to private property. Residents in the community of Central, Utah, were concerned

about fire risk related to co-locating the transmission line with gas pipelines as well as concerns about firefighter safety in an area with a high risk of wildland fires. Several residents in Henderson, Nevada, voiced concerns about the effects of electromagnetic fields on humans, potential sabotage activities, and structure/conductor failure near homes. Increased construction traffic on roadways was a concern throughout the analysis area.

1.8.7 Impacts to Areas with Special Management Designations

Throughout the Project area, comments were received about potential impacts to BLM Areas of Critical Environmental Concern (ACECs), BLM WSAs, USFS IRAs, national monuments/landmarks, national historic trails (NHTs), and state and federal parks. Primary concerns were visual changes that could be viewed from managed or protected areas.

1.8.8 Cumulative Impacts

Attendees expressed concern regarding the cumulative effects of numerous transmission lines being proposed within already overcrowded corridors throughout various geographies within the analysis area. Specific areas of concern were along Interstate 80 (I-80) in Wyoming; through the Dixie National Forest and Central, Utah; and in the Las Vegas area on the east side of the Las Vegas Valley.

1.8.9 Socioeconomic Impacts (Property Values and Tax Base)

Many landowners were concerned about how the Project would affect property values, particularly where the Project would cross private lands or would be located near urban areas. Throughout the analysis area, there were comments that the Project could provide economic benefit to their rural communities through expansion of the tax base and temporary employment during construction.

1.9 Organization of this EIS

The Project Draft EIS was organized to facilitate comparison of corridor alternatives and to enable the agencies to efficiently determine the agency preferred alternative. The Draft EIS addresses the direct, indirect, and cumulative environmental impacts resulting from developing the Project. The content and scope of each chapter is described below.

Chapter 1.0 – Introduction

Chapter 1.0 provides an introduction to the Project and includes a description of the proposed Project, the agencies' purpose and need, and the applicant's interests and objectives. This chapter discusses the federal approval process, decisions to be made, and authorizing federal laws. Relevant state and local regulations are summarized in **Appendix A**. The pre-scoping corridor screening process is presented in **Appendix B**. A summary of the scoping process and issues identified during the scoping period are presented.

Chapter 2.0 – Project Description and Alternatives

Chapter 2.0 provides a description of the alternatives to be analyzed, including the No Action Alternative. Each transmission line alternative is described in terms of its land requirements and the ancillary facilities required for implementing the alternative. The process for identifying the corridor alternatives to be analyzed (or not analyzed) in the EIS is outlined in this chapter. Detailed descriptions of BMPs, design features, and agency stipulations are presented in **Appendix C**. TransWest's detailed description of the technical components of the project are contained in **Appendix D**.

Chapter 3.0 – Affected Environment and Environmental Consequences

For each resource that could be impacted by the Project, Chapter 3.0 describes the analysis area, existing conditions, and environmental consequences of each Project alternative (including the No Action Alternative). Additionally, Chapter 3.0 provides the regulatory background, sources for baseline data, and a description of the impact indicators and methodology used to determine Project impacts. Proposed mitigation measures to

avoid or minimize these impacts and residual impacts after implementation of this mitigation also are disclosed. Resource-specific details not contained in the EIS sections can be found in **Appendix E** through **Appendix I**.

Chapter 4.0 – Federal Agency Land Use Plan Amendments

Chapter 4.0 addresses the federal land use plan amendments required for the Project. Plan amendments are related to the specific land management plan and alternative corridor. Environmental impacts and planning implications associated with each plan amendment are described.

Chapter 5.0 – Cumulative Impacts

Chapter 5.0 discloses the cumulative impacts of the proposed Project when considered with other non-connected past, present, and reasonably foreseeable future actions (RFFAs). As per CEQ's *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997), the cumulative effects of past and present actions are summarized in Chapter 3.0 under the current affected environment sections for each resource. The cumulative impacts section then considers RFFAs and their additional impacts for all Project alternatives.

2.0 Project Description and Alternatives

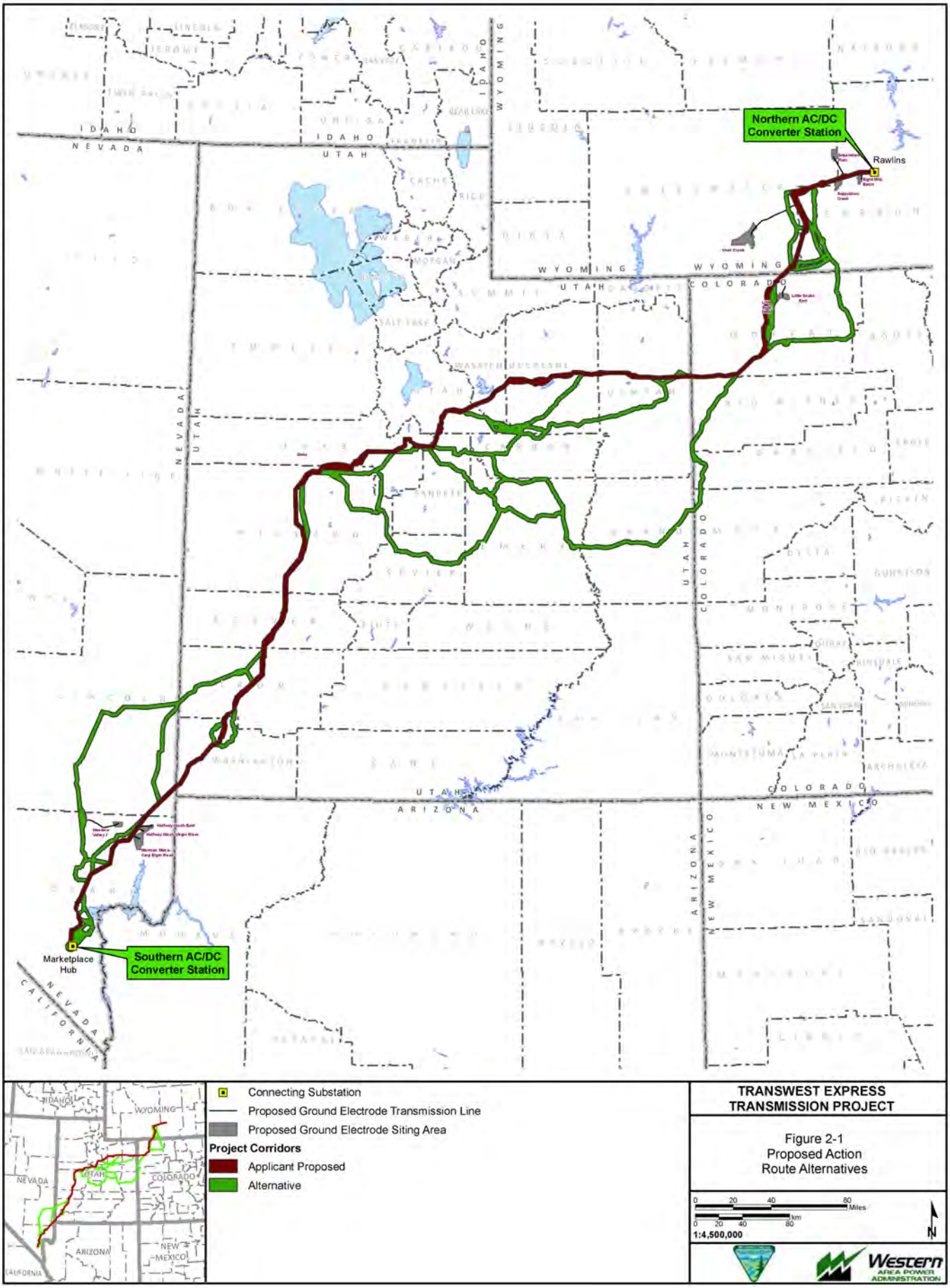
2.1 Project Overview

2.1.1 Proposed Action

The proposed action would consist of the following facilities and improvements:

- A 600-kV DC transmission line, approximately 725 miles in length, extending across public (state and federal) and private lands in Wyoming, Colorado, Utah, and Nevada. The transmission line ROW would be approximately 250 feet wide. Alternative transmission line routes have been developed to analyze the range in resource impacts. **Figure 2-1** depicts these routes that range up to 904 miles in length.
- Two terminal stations would be located on private or public lands at either end of the transmission line, near Sinclair, Wyoming, and at the Marketplace Hub in the Eldorado Valley near Boulder City, Nevada. Terminal facilities would include converter stations and related substation facilities necessary for interconnections to existing and planned regional AC transmission systems.
  - Facilities within the Northern Terminal Station would be situated on approximately 235 acres and include an AC/DC converter station to convert alternating electrical current to direct current, thereby allowing power from the AC system to be transmitted on the Project transmission system.
  - Facilities within the Southern Terminal Station would be situated on approximately 205 acres and include an AC/DC converter station to convert direct current to alternating current, allowing power transmitted on the Project transmission system to enter the regional grid serving California, Nevada, and Arizona. The Project also would be capable of transmitting power in a south-to-north direction, although the primary purpose of the line would be for north-to-south power transfers.
- Access routes, including improvements to existing roads, new overland access and new unpaved roads to access the proposed Project facilities and work areas during the construction, operation, and maintenance phases.
- Ancillary facilities including:
  - Communications systems: a network of 12 to 15 fiber optic communication and regeneration sites, typically within the 250-foot-wide transmission line ROW, and microwave facilities at each terminal.
  - Two ground electrode facilities, each sited on approximately 160 acres with 20 to 90 acres of ground disturbance during operation, to be located on private or public lands in either Wyoming or Colorado, and Utah or Nevada. A low voltage electrical line would connect the ground electrode facilities to the terminals. A ground electrode is required to maintain an electrical circuit through the ground to maintain system operations following emergency events resulting in unexpected loss of one of the two poles (or circuits) of the Project terminal or converter station equipment. One ground electrode facility would be located within 100 miles of each of the Northern and Southern terminals.

The proposed Project has the capability to transmit power generated by existing and/or reasonably foreseeable renewable or non-renewable sources in Wyoming. These include a variety of proposed wind projects, which are analyzed in detail in separate NEPA analyses and whose cumulative impacts, if applicable, are disclosed in Chapter 5.0 of this EIS. It is important to note that none of these projects are exclusively dependent upon this proposed transmission line, nor is this transmission line dependent exclusively on any of those projects.



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2.1.2 Design Options

Design options would meet the Project's stated objectives only if transmission capacity becomes available to transmit the energy delivered from Sinclair, Wyoming, to Delta, Utah, by the Project on to Southern California via the existing IPP 2,400-MW, 500-kV DC Southern Transmission Systems (STS). Because capacity is not currently available on the STS, the design options currently do not meet the Project's interests and objectives. Implementation of the design options would only be considered under the conditions that sufficient capacity, approximately 1,500 MW, became commercially available to transmit energy delivered by the project to California; and that the Project was able to establish commercial interconnection agreements with the utility owning and operating the IPP transmission line (currently Los Angeles Department of Water and Power [LADWP]).

If implemented, these design options would consider the same alternative transmission line routes as the proposed action; however, each would require development of different terminal locations, electrode bed system locations, tower types, and ancillary facilities as summarized below.

2.1.2.1 Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Under this design option, this project would deliver energy to the IPP near Delta, Utah, then complete delivery of energy to markets in the Desert Southwest region through both the 1,500-MW, 500-kV transmission line proposed as part of this project and through the existing STS between Delta, Utah, and Adelanto, California.

Design Option 2 would entail construction of a 3,000-MW, 600-kV DC transmission line approximately 442 miles in length, from the Northern Terminal in Sinclair, Wyoming, to a new DC/AC converter station near the existing IPP substation near Delta, Utah. From the new DC/AC converter station in Utah, a single circuit 1,500-MW, 500-kV AC transmission line approximately 348 miles in length would be constructed to one of the existing substations in the Eldorado Valley, south of Boulder City, Nevada (Marketplace Hub).

Compared to the proposed action, Design Option 2 would:

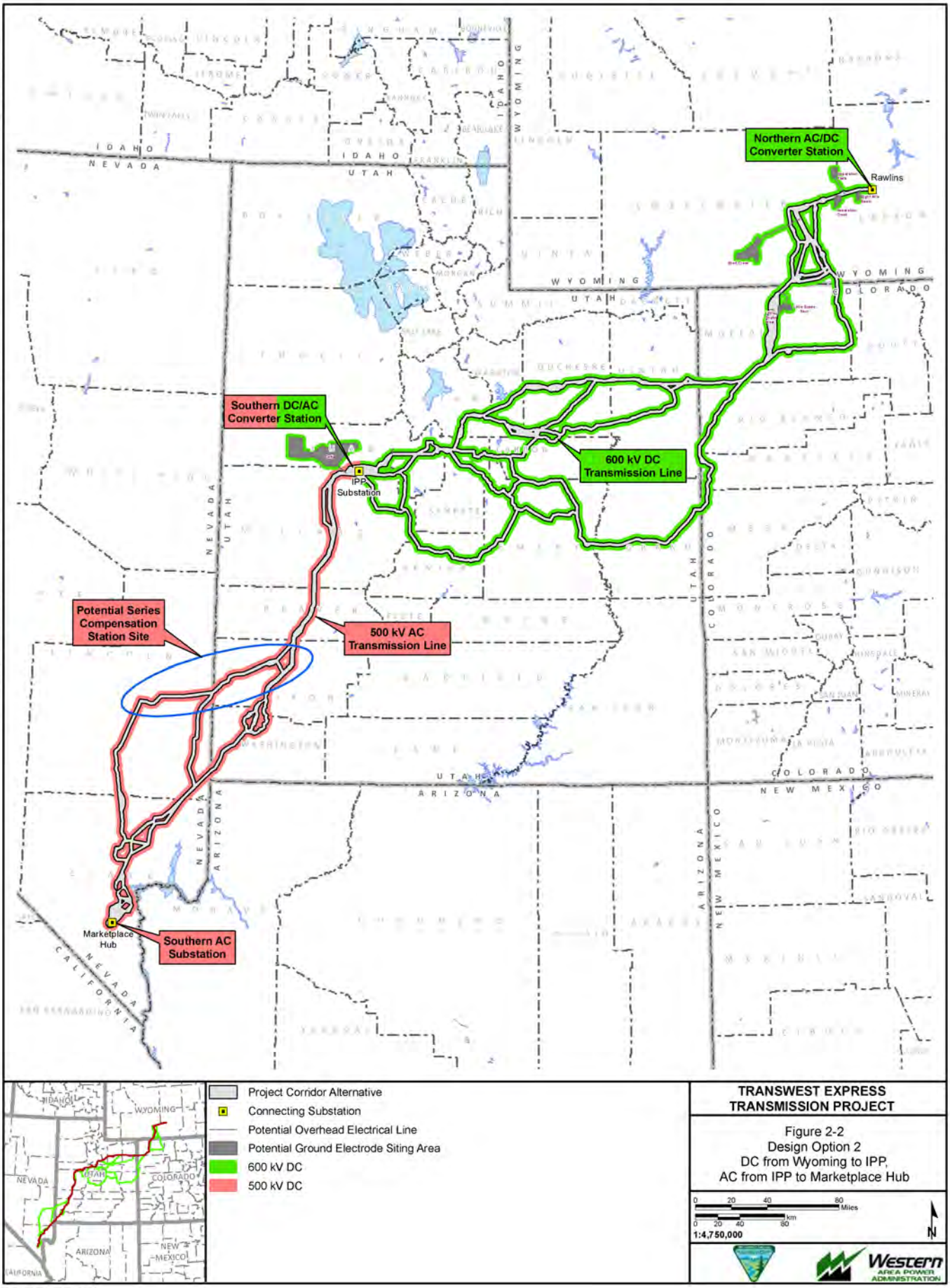
- Replace the 600-kV DC transmission line with a single circuit 500-kV AC line from near IPP in Millard County, Utah, to one of the existing Marketplace Hub substations in Clark County, Nevada;
- Eliminate the Southern Terminal and ground electrode system in Clark County, Nevada, and replace these facilities with similar facilities near IPP in Millard County, Utah;
- Require additional new facilities, including a double circuit 345-kV transmission line (less than 5 miles in length and similar configuration as those described for the 600-kV DC transmission line) for interconnection at IPP and a 500-kV series compensation station (similar to a 500-kV substation) located near the halfway point in the southern 500-kV AC line.

Figure 2-2 depicts the configuration of Design Option 2.

2.1.2.2 Design Option 3 – Phased Build Out

This design option would utilize a two-phase approach. The phased approach is more costly than building out the full system as a single non-phased project and would only be required if the demand for Wyoming resources in the Desert Southwest proves to be slower in development than expected.

Phase one would entail construction of a 3,000-MW, 600-kV DC transmission line approximately 442 miles in length between the location of the proposed Northern Terminal in Sinclair, Wyoming, to the IPP substation near Delta, Utah. This portion of transmission line would require an AC configuration (three conductors and structures to support them), because this phase initially would be operated as a 1,500-MW, 500-kV AC transmission system.



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Phase two would occur at some point in the future when market demands warrant converting the line's operation from 1,500 MW to 3,000 MW. This phase would involve constructing the remaining portion of the 3,000-MW, 600-kV DC line from IPP to the Southern Terminal, south of Boulder City, Nevada, construction of the Northern and Southern terminals and ground electrode systems, and converting operations to a DC system. The subsequent conversion from 500-kV AC to 600-kV DC would not require physical changes to the structure or wire system constructed in phase one; one of the three conductor bundle sets would be de-energized and left in place.

Compared to the proposed action, Design Option 3 would:

- Construct a 600-kV DC transmission line from Sinclair, Wyoming, to IPP near Delta, Utah, with an AC configuration (three conductors and structures to support them) for AC operation until phase two completion.
- Construct a 500-/345-kV substation near the IPP in Millard County, Utah, for AC operation until phase two completion.
- Require additional new facilities including a double circuit 345-kV transmission line (less than 5 miles in length for interconnection at IPP) and a 500-kV series compensation station located near the halfway point in the northern 500-kV AC line for operation until phase two completion.
- Delay construction of southern 600-kV DC transmission line from IPP to Marketplace Hub, the Northern and Southern terminals and ground electrode systems.

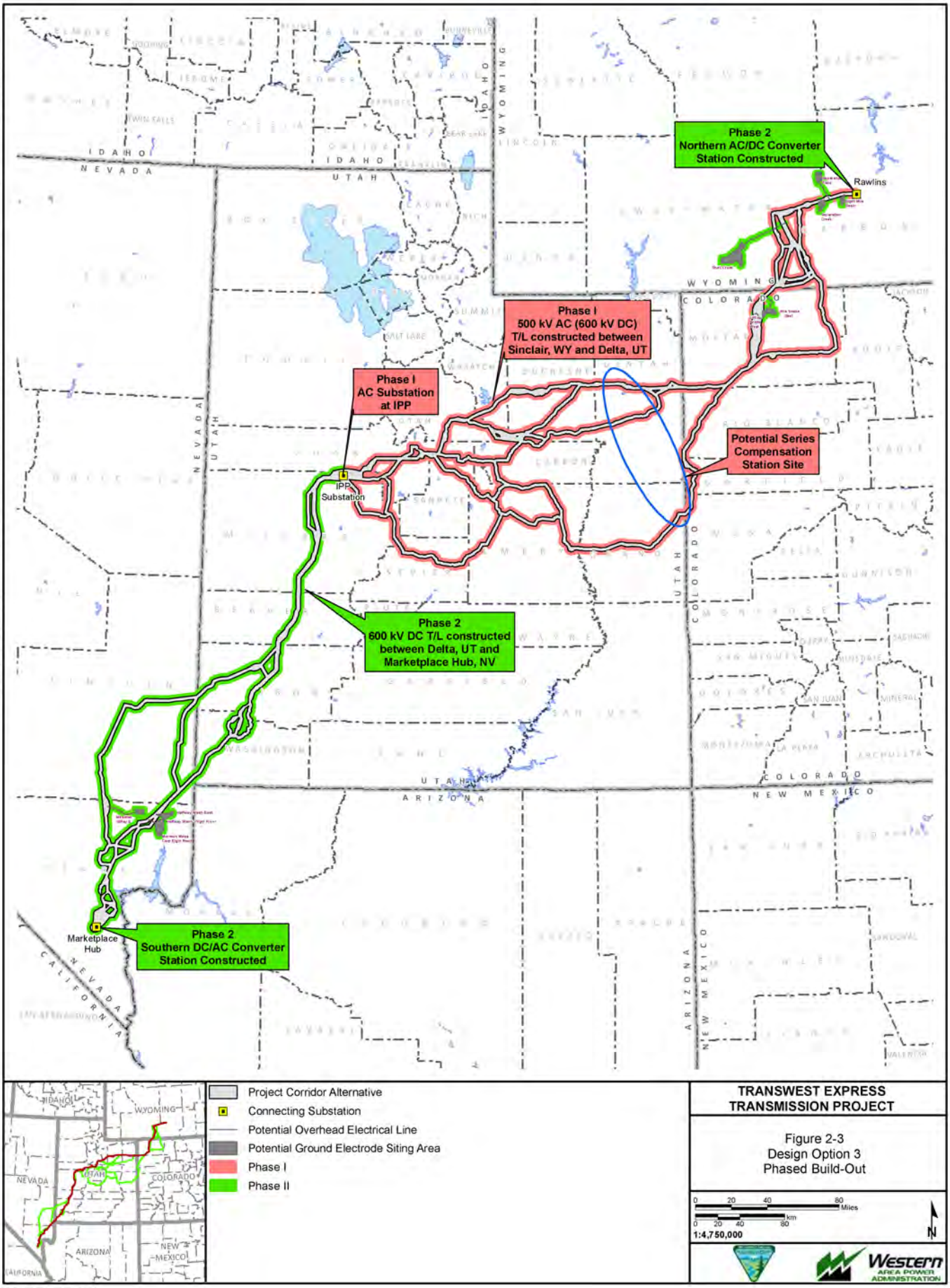
Figure 2-3 depicts the configuration of Design Option 3.

2.2 TransWest Express Transmission Project Planning

System planning studies have been underway since 2005 to assist in identifying a range of alternatives for the Project. The Project was included in a Regional Planning Project Review (RPPR) conducted in accordance with WECC Planning Procedures (TWE 2008). Findings included in the RPPR Conceptual Technical Report concluded that this Project would help to serve the needs of the broad region of Utah, Arizona, Nevada, and southern California in a cost-effective manner while minimizing potential environmental impacts. Studies carried out by the Northern Tier Transmission Group (NTTG) (a subregional transmission group of WECC) and WestConnect supported the development of lines from southern Wyoming to the desert southwest (NTTG 2007; WestConnect 2008). Three important criterion evaluated by TransWest in planning and developing the proposed route for the Project were: 1) capacity of the facility; 2) reliability standards; and 3) the use of designated corridors.

Capacity. The Project would provide the transmission infrastructure necessary to reliably and cost-effectively provide up to 3,000 MW of electric power capacity from Wyoming to the desert southwest (TWE 2010). The 3,000-MW capacity would be sufficient to support the reasonably foreseeable renewable generation sources anticipated in south-central Wyoming as well as other existing sources. At 3,000 MW, the Project would be one of the largest transmission elements within the WECC system and could facilitate achieving renewable energy goals and Renewable Portfolio Standards in the southwest.

Reliability. Transmission systems in the U.S. are planned, operated, and maintained to meet reliability standards and guidelines of the NERC. Additionally, transmission owners and operators are governed by WECC reliability standards that may be in addition to, or more stringent than those required by NERC. The WECC reliability standards affect the Project ROW requirements as well as separation distance requirements from other high voltage lines. See the PDTR (**Appendix D**) for additional information on reliability standards and other required criteria.



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Reliability standards that limit the operational capacity of any single transmission system element are based on a complex contingency analysis that considers the impact to system operations following various events (i.e., equipment failures, line outages). TransWest has developed minimum line separation requirements based on voltages of other parallel lines and average span distances of the proposed Project transmission line. Application of the NERC and WECC reliability standards and preliminary transmission system contingency analyses indicate that the proposed Project transmission line should be optimally no closer than 1,500 feet from parallel transmission lines rated at 345 kV and higher, and no closer than 250 feet from lines that are operated at less than 345 kV. TransWest has developed a Transmission Line Co-location Framework that provides additional information on the co-location of the Project within corridors with existing transmission lines. The framework was designed to provide flexibility to co-locate transmission lines closer as needed to mitigate resource impacts. See the PDTR (**Appendix D**) for additional information on this framework.

Use of Designated Corridors. Proposed and alternative Project corridors follow designated energy corridors on public lands to the greatest extent practicable, including those collectively recommended by the DOE in November 2008 as WWECs pursuant to Section 368 of the Energy Policy Act of 2005; corridors identified by the BLM and the USFS in their respective land management plans; and corridors designated within state and county plans. The ROD to designate the WWECs served to amend the federal land management plans to incorporate the corridors. The decision also adopts Interagency Operating Procedures for the administration of energy transport development within the corridors. These agency-designated utility corridors and the Project proposed and alternative corridors are depicted in **Figure 2-4** through **Figure 2-7**. Generally, the designated corridors encompass existing transmission lines and other existing and planned linear facilities. The designated corridors represent opportunities for siting transmission lines, particularly when a linear ROW has been permitted or constructed through an environmentally sensitive area. In this situation, the existing ROW would be treated as a corridor that provides an opportunity to minimize additional environmental impacts.

Environmental organizations filed a complaint in federal court challenging the designation of multiple corridors identified in the WWEC programmatic EIS, including several corridors along the proposed Project and alternatives considered in this EIS. The WWEC programmatic EIS “corridors of concern” identified by the plaintiffs that overlap with the proposed Project route and alternatives are depicted in **Figure 2-4** through **Figure 2-7**. The complaint was dismissed as a result of a settlement agreement between the plaintiffs and the federal defendants dated July 11, 2012.

2.3 Alternative Corridor Development and Selection Process

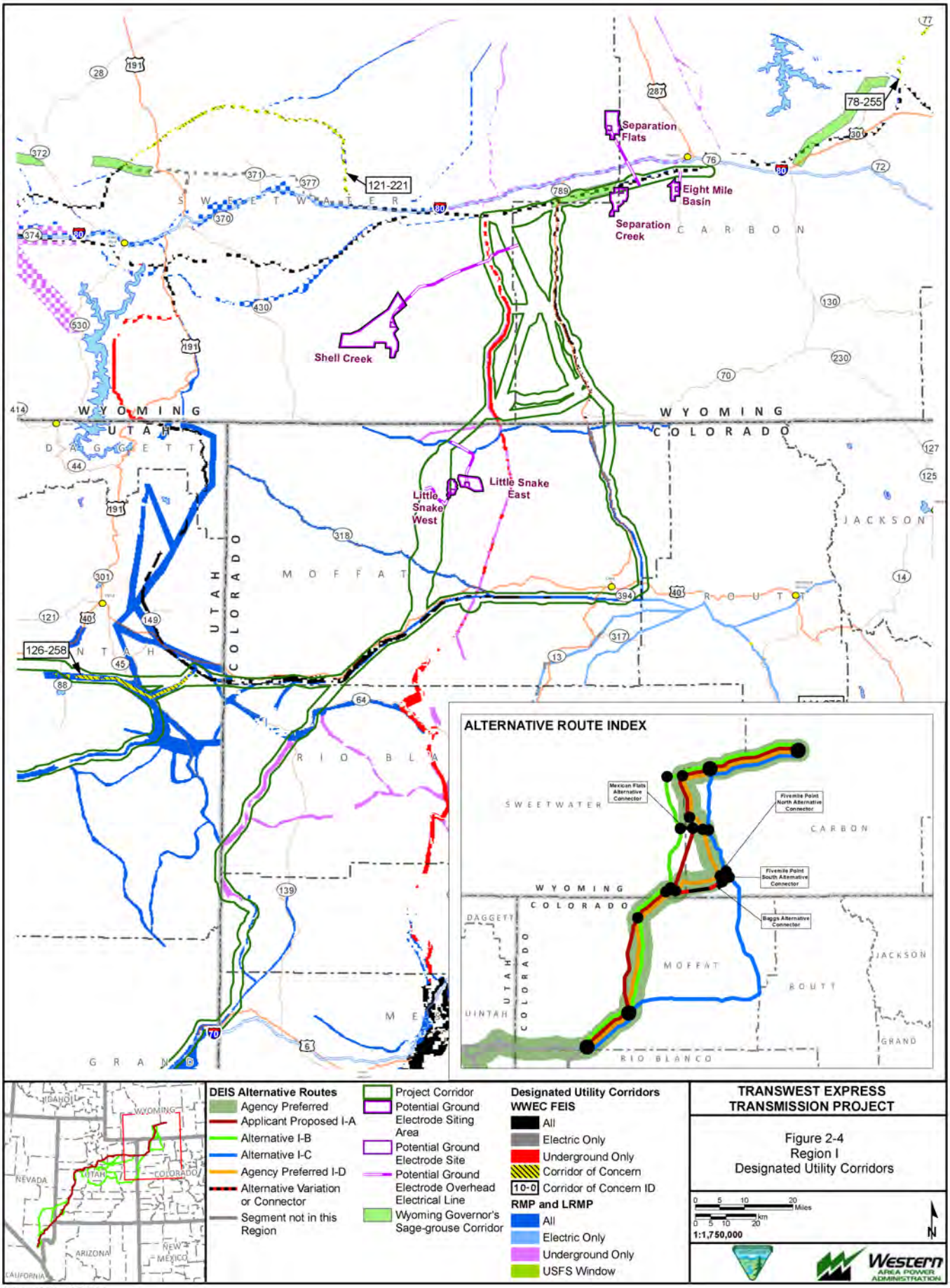
2.3.1 TransWest Proposed Action and Alternative Corridors

In developing a proposed route to facilitate the transmission of power to markets in the desert southwest, multiple regional corridor studies were conducted. These studies focused on corridors up to 4 miles wide that had been identified as desirable by electrical system planners. During this process, environmental data and federal land management plans were reviewed, federal agency communication and consultation was undertaken to refine the corridor segments, and reference lines (see Section 2.5, Alternative Transmission Line Routes and Ancillary Facilities) were developed based on environmental and engineering constraints and constructability review. The Project history and process used in evaluating alternatives while developing the applicant’s proposed route is documented in the PDTR (**Appendix D**).

In SF 299 ROW filings with the BLM, TransWest provided maps illustrating a proposed Project corridor from Project origin to terminus as well as corridors identified through the TransWest regional siting studies. The lead agencies reviewed all potential corridors, solicited additional agency-developed alternative corridors, and screened the corridors included in the January 2010 Amended SF 299 as well as the corridors updated in the July 2010 Preliminary POD.

2.3.2 Pre-Scoping Corridor Screening

The lead agencies conducted a corridor refinement process to identify potentially feasible corridors to be analyzed in the EIS, eliminating corridors that were duplicative or presented extensive resource constraints.


Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake West
Little Snake East
121-221
78-255
126-258
SWEETWATER
CARBON
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
JACKSON
ROUTT
RIO BLANCO
GRAND
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Fivemile Point South Alternative Connector
Baggs Alternative Connector
UINTAH
DEIS Alternative Routes
Agency Preferred
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Wyoming Governor's Sage-grouse Corridor
Designated Utility Corridors
WWEC FEIS
All
Electric Only
Underground Only
Corridor of Concern
10-0 Corridor of Concern ID
RMP and LRMP
All
Electric Only
Underground Only
USFS Window
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 2-4
Region I
Designated Utility Corridors
Miles
km
1:1,750,000
Western AREA POWER ADMINISTRATION
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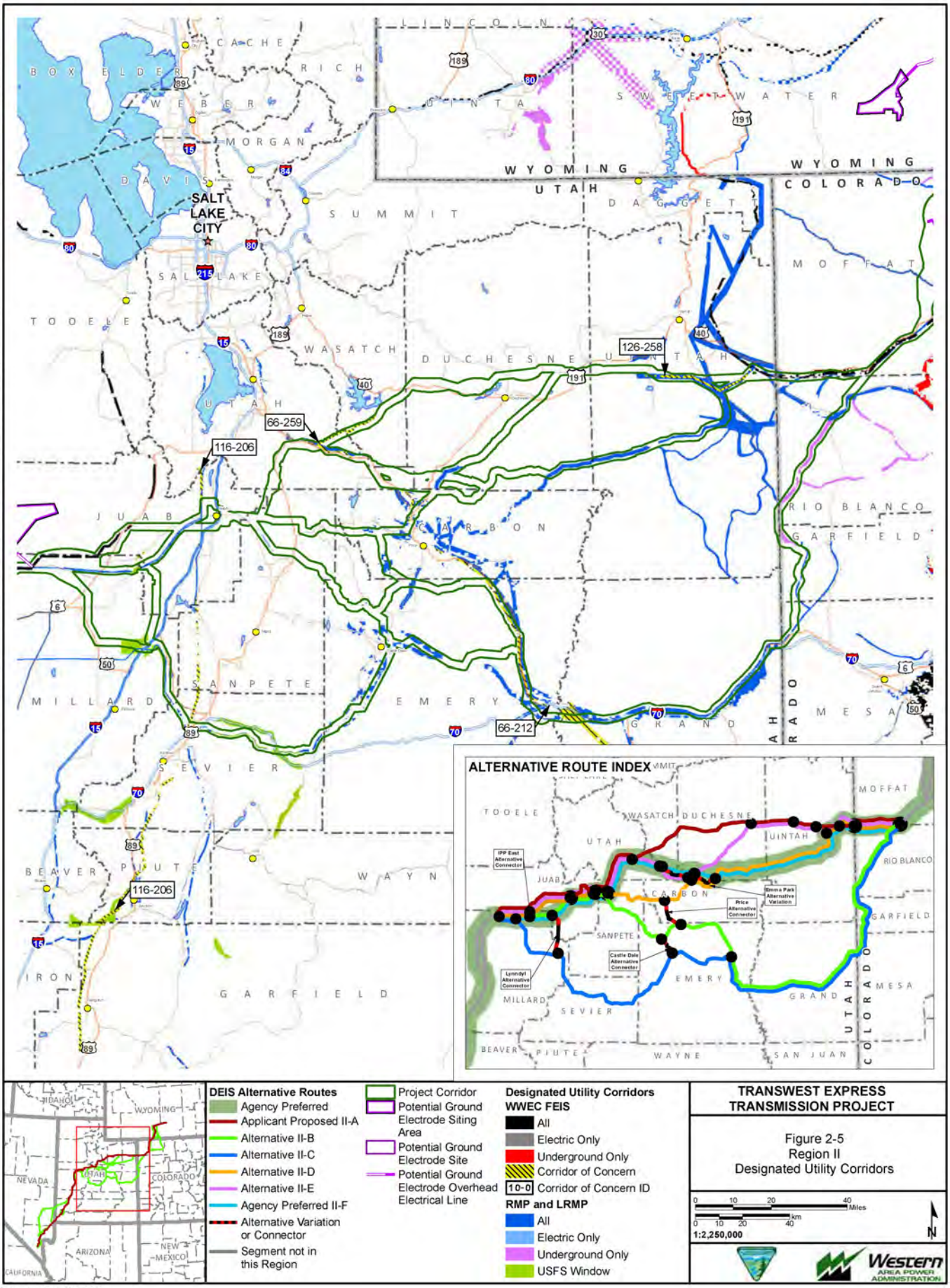

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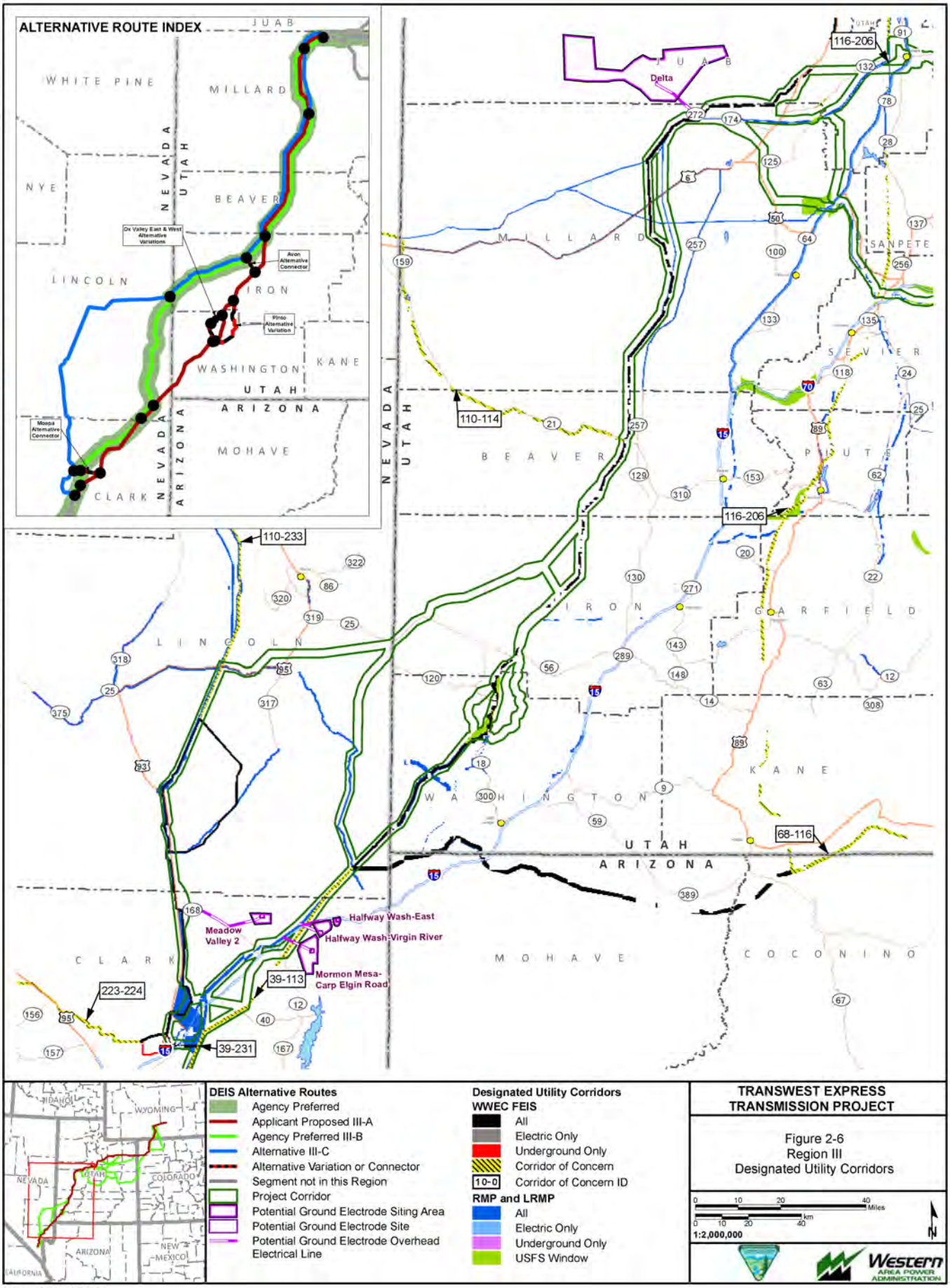
ALTERNATIVE ROUTE INDEX
WHITE PINE
MILLARD
NYE
BEAVER
LINCOLN
IRON
WASHINGTON
KANE
UTAH
ARIZONA
MOHAVE
CLARK
NEVADA
Dx Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
Delta
116-206
110-114
110-233
68-116
223-224
39-113
39-231
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
SANPETE
SEVIER
PIUTE
GARFIELD
COCONINO
DEIS Alternative Routes
Agency Preferred
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Designated Utility Corridors
WWEC FEIS
All
Electric Only
Underground Only
Corridor of Concern
10-0 Corridor of Concern ID
RMP and LRMP
All
Electric Only
Underground Only
USFS Window
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 2-6
Region III
Designated Utility Corridors
1:2,000,000
Western AREA POWER ADMINISTRATION
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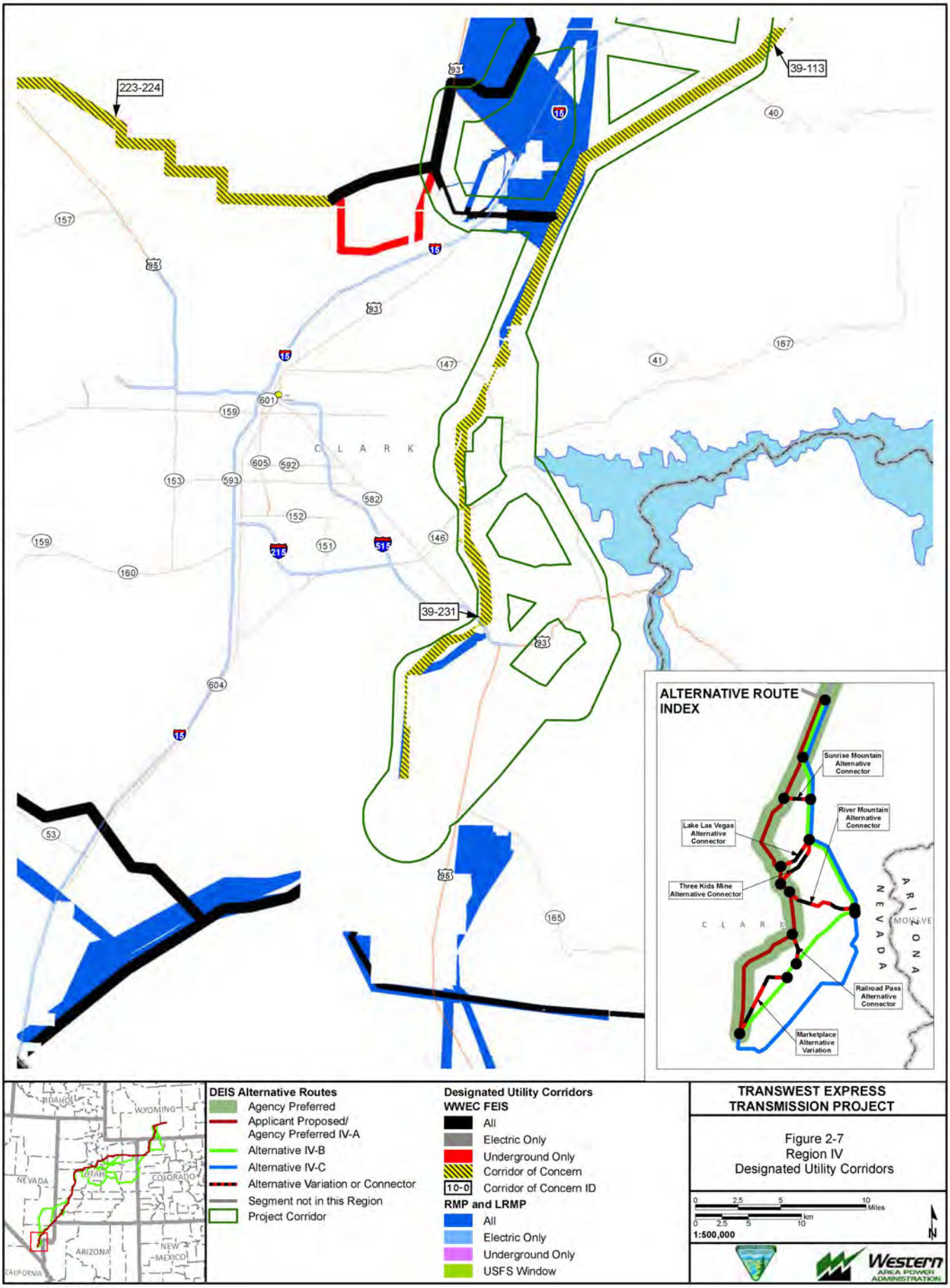

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This review used available data from government and other sources, aerial photography, and input from land management agencies received during pre-scoping meetings. A description of the methods and the results of this process are presented in the TransWest Express Transmission Project Corridor Screening Report (**Appendix B**).

The following criteria were used to retain alternatives for detailed analysis in the EIS:

- Does the alternative result in measurably diminished adverse environmental effects (fewer detrimental effects, less severe effects, or shorter-term effects) than the applicant's proposed corridor for any resource?
- Does the alternative address resource conflicts?
- Is the alternative technically and economically feasible?

Comparative reviews of alternative corridors also were conducted to arrive at a reasonable range of alternative corridor segments to carry into public scoping. The screening review considered the identified environmental constraints, agency input, length within existing utility corridors, and overall length. The rationale for not advancing a particular corridor segment forward for further analysis was based on the criteria listed above. In some instances, corridor segments were added or modified to address identified environmental concerns or changes in Project design.

The results of the pre-scoping review were shared with lead agency Interdisciplinary (ID) teams, and cooperating agencies in the form of maps and supporting rationale for alternative corridor selection. After receiving and addressing input from reviewers, a range of alternative corridors were presented to the public during the public scoping period (January through April 2011). These alternative corridors are illustrated on maps in **Appendix B**.

2.3.3 Formulation of EIS Transmission Line Alternatives

Numerous comments on the alternatives were received during public scoping. These comments were recorded and evaluated in the public scoping summary report (BLM and Western 2011). The evaluation of scoping comments identified several issues that helped to inform the lead agencies' identification of those alternative corridors to retain for further analysis. In addition, corridor alternative variations and alternative connectors were added to address specific regional or local concerns or to provide additional routing flexibility in constrained areas.

Due to the length of the transmission line, the alternative transmission routes were split into four distinct regions for the purpose of presenting clear impact comparisons between alternative segments:

- Region I: Sinclair, Wyoming, to northwest Colorado near Rangely, Colorado;
- Region II: Northwest Colorado to IPP near Delta, Utah;
- Region III: IPP to North Las Vegas, Nevada; and
- Region IV: North Las Vegas to Marketplace Hub near Boulder City, Nevada.

Region boundaries were largely based on areas where the alternative reference line routes converge (i.e., have common nodes or intersection points). The regions were developed so that the alternatives within each region could be selected independently of the alternatives selected in the other regions. Alternative variations and alternative connectors within each region were added for analysis in response to public and agency input on specific issues. Because these variations and connectors are linked with specific alternatives within a region and analyzed with their respective alternative, they are not considered or analyzed as independent alternatives.

In late October 2011, after completing adjustments to the alternatives based on input received during public scoping, the lead agencies presented the EIS alternatives to be retained for detailed analysis to the ID teams and the cooperating agencies. TransWest reviewed the alternatives proposed for inclusion in the EIS analysis and provided revised reference lines, accounting for utility separation criteria and, to the extent practicable, identified resource constraints. This process of alternatives adjustments was repeated in May of 2012, in response to the review of the Preliminary Draft EIS by the ID teams and cooperating agencies. At this time, the BLM also began to develop the agency preferred alternative.

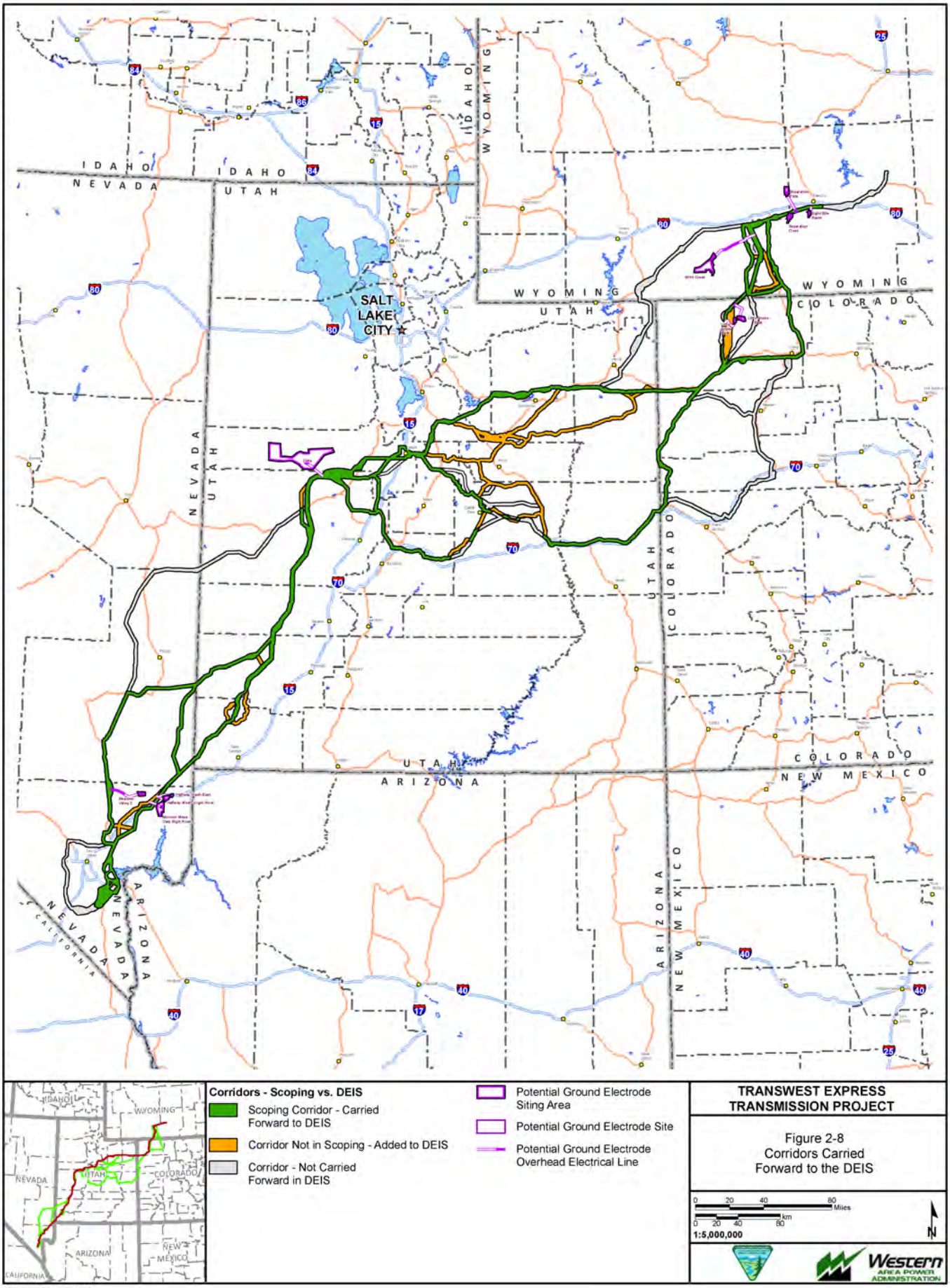
Figure 2-8 provides the corridors retained for further analysis. The corridors not recommended for further analysis also are shown.

The TransWest proposed action was analyzed as presented by TransWest, including modifications by TransWest in southern Wyoming, adjacent northern Colorado, west-central Utah between Nephi and Delta, and west of Delta (see **Appendix B**). The following factors influenced the selection of corridor alternatives to be carried forward in the analysis:

- The TransWest-proposed corridor crosses the Sunrise Mountain ISA. In recognition of the siting issues surrounding the narrow existing utility corridor, corridor alternatives have been developed for analysis on Lake Mead NRA land administered by the NPS.
- The TransWest-proposed corridor includes potential alignments that would cross IRAs in the Uinta, Manti-La Sal, and Dixie national forests. In recognition of these potential crossings, corridor alternatives have been developed that avoid those areas.

The following alternative corridors were added for analysis based on input received from public scoping, the ID teams, and cooperating agencies:

- Five alternative segments were added between I-80 and the Wyoming-Colorado state line to decrease impacts to visual and other resources in the area (recommendation of the BLM Rawlins FO).
- One alternative segment was added between the Wyoming-Colorado state line and U.S. Highway 40 to decrease impacts to visual, land use, and other resources in the area (recommendation of the BLM Little Snake FO).
- Six alternative segments were added in Utah through Uintah, Duchesne, Carbon, Utah, Wasatch, and Sanpete counties to decrease impacts to NHTs, land use, and other resources in the area (recommendation of the USFS).
- Seven alternative segments were added in Utah through Duchesne, Carbon, Utah, and Wasatch counties in consideration of greater sage-grouse planning efforts while also considering the decreased impacts in the point listed above (recommendation of the BLM Utah State Office).
- Eight alternative segments were added (and four segments removed) near Castle Dale, Utah, to avoid a NHT (recommendation of the BLM Price FO).
- A segment was added west of Delta, Utah, to avoid cultural and other resources in the Sevier River area (recommendation from the BLM Fillmore FO).
- An alternative segment was added in Iron County, Utah, to avoid greater sage-grouse habitat in the Escalante Desert area (recommendation of the BLM Cedar City FO).
- Four alternative segments were added near Central, Utah, to avoid or decrease multiple resource impacts (recommendation of the USFS and public scoping comments).
- An alternative segment was added within an existing transmission line utility corridor and co-located with existing utilities across the Moapa Indian Reservation to avoid the proliferation of utility corridors (recommendation from the BLM Southern Nevada District, and public scoping comments from the Logandale area).



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2.4 Elements Common to All Action Alternatives

Regardless of the transmission route or design option selected, there are specific Project requirements, constraints, and elements that apply to all action alternatives. These elements include federal environmental protection requirements and plan amendments, applicant design features and committed measures, and facilities associated with the Northern and Southern terminals.

2.4.1 Federal Requirements

In accordance with laws governing the management and use of federal lands and interstate commerce, federal agencies are empowered to grant long-term utility uses on federal lands subject to compensation, environmental stipulations, and renewal at the end of the term specified. To reach decisions to grant utility uses, involved agencies evaluate Project conformance with agency plans and policies to ensure proponent commitments and agency BMPs are sufficient to adequately protect the natural and human environment. After consideration of any residual environmental impacts, these factors help the agencies determine if the Project is in the public interest. A plan conformance review for all alternatives, the need for plan amendments, and a list of conceptual plan amendments are contained in Chapter 4.0 of this EIS.

The performance standards contained in the WWEC programmatic EIS provide a framework for the environmental protection measures that would be implemented by the lead and cooperating agencies on federal lands under their jurisdiction. Implementation of these standards was a required step in evaluating effects on resources in the impact analysis. In addition to these broad-based practices, additional local plan decisions and guidelines are included to supplement the WWEC measures. A summary of the WWEC measures and other relevant agency BMPs are included in **Appendix C**.

2.4.2 Applicant Project Description and Design Features

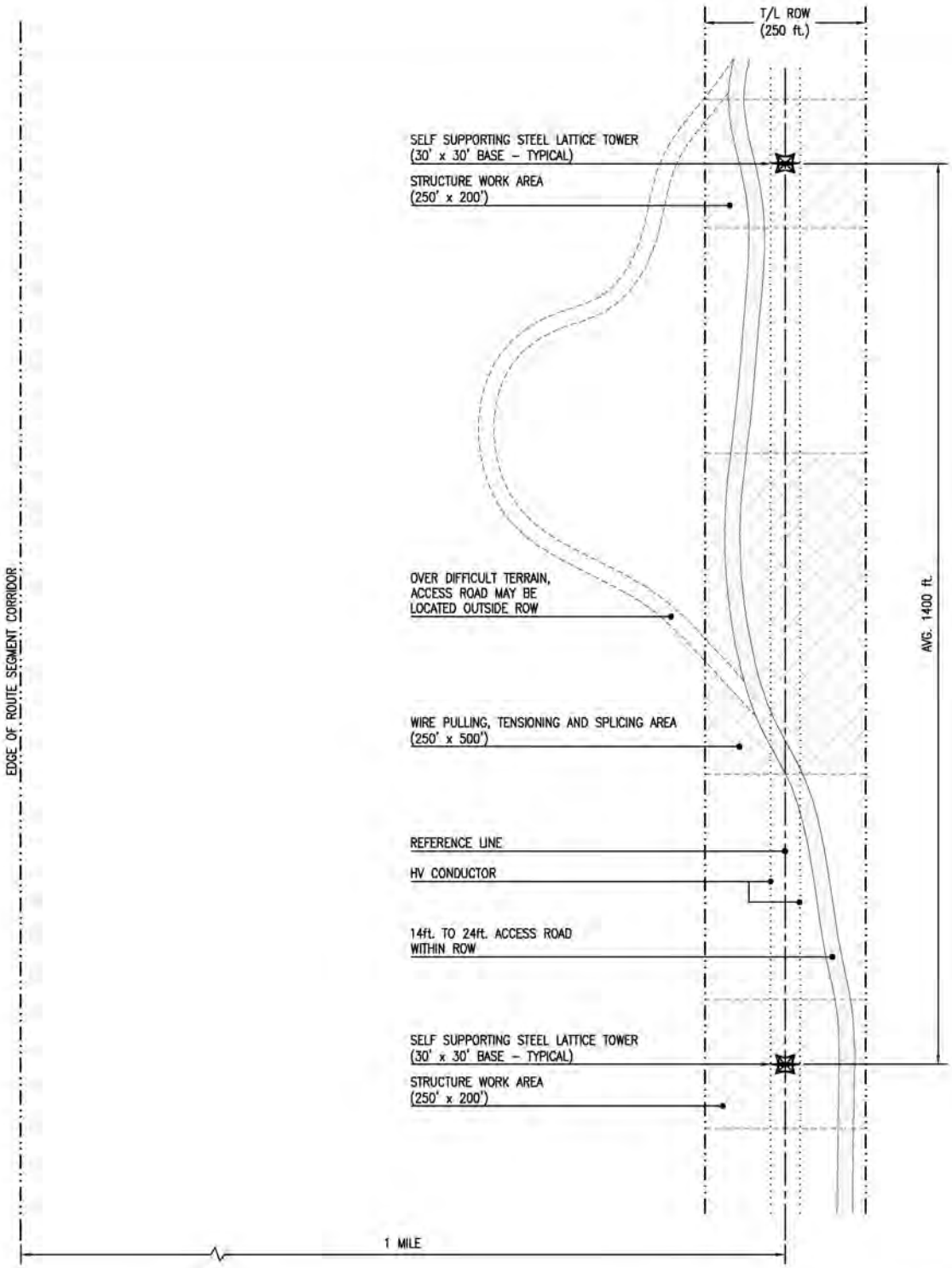
2.4.2.1 Project Description

The EIS description of alternatives and ancillary facilities was developed from the Project Preliminary POD (TWE 2010) and from the PDTR (**Appendix D**). **Figure 2-9** depicts a typical transmission line construction ROW and temporary work areas; **Figure 2-10** depicts the three types of transmission line structures under consideration. Typical tower erection and conductor stringing construction is depicted in **Figure 2-11**. All of the details on proposed Project facilities, construction methods, Project operation, and maintenance practices, including vegetation management, are provided in **Appendix D**. **Table C-3** (**Appendix C**) provides the TransWest committed environmental protection measures (i.e., design features), which are part of the proposed Project.

During the construction of the transmission line, areas for access roads, tower construction sites, communication sites, line stringing and tensioning sites, and other temporary work areas (e.g., staging areas, concrete batch plants, storage yards, helicopter fly yards) would be disturbed. The majority of the disturbance areas would be within the 250-foot-wide transmission line ROW; all disturbance areas would be located within the 2-mile transmission line corridor.

During the operation and maintenance of the transmission line, tower location sites and communication sites would remain disturbed in place and all would be located within the 2-mile transmission line corridor. Access roads also would be located within the 2-mile transmission line corridor, to the extent practicable.

The Project terminals and ground electrode system sites are detailed in Section 2.4.3, Facilities Common to All Action Alternatives, and the alternative routes of the transmission line are detailed in Section 2.5, Alternative Transmission Line Routes and Ancillary Facilities.

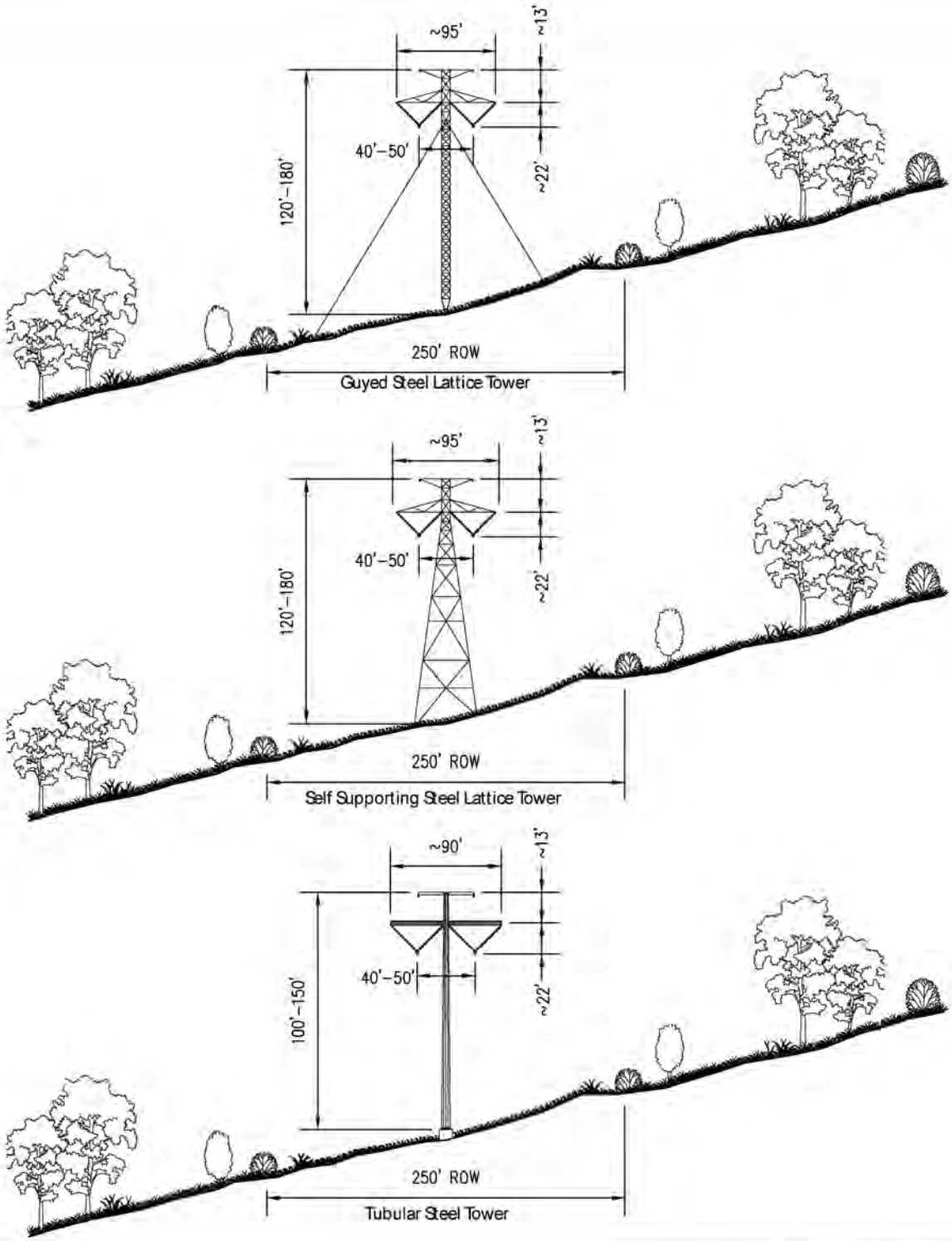


TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 2-9

Typical Transmission ROW
and
Temporary Work Areas

Source: TWE 2011

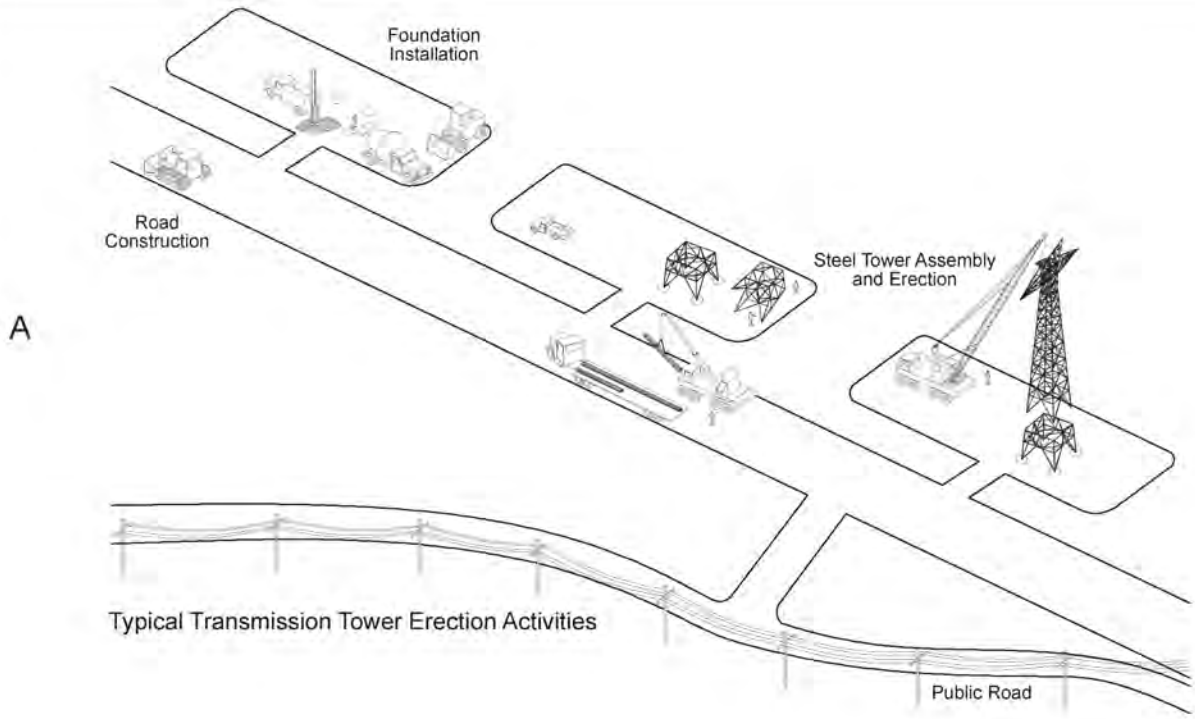


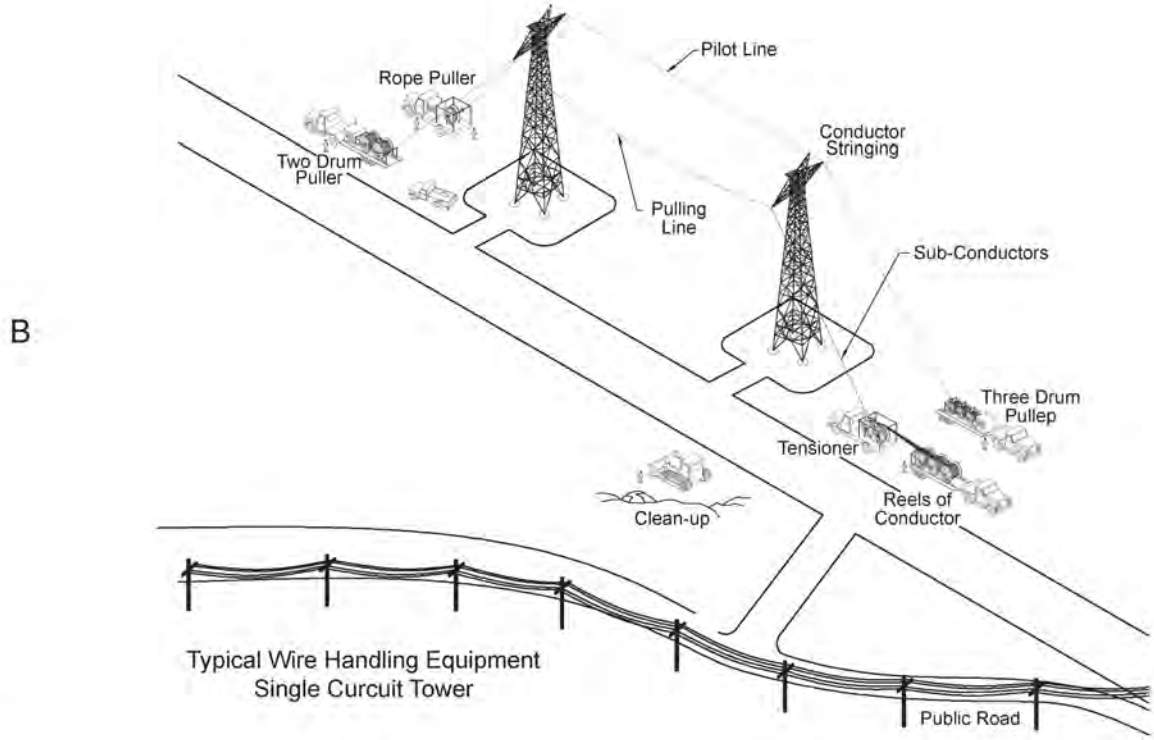
Transwest Express Transmission Project

Figure 2-10

Potential Transmission Line Structure Types

Source: TWE 2011





Transwest Express Transmission Project

Figure 2-11

Typical Tower Erection and Conductor Stringing Construction

Source: TWE 2011

2.4.2.2 Project Design Features, Best Management Practices, and Required Stipulations

Project design features, BMPs, and required stipulations are requirements for the construction, operation, maintenance, and decommissioning of the transmission line, regardless of which alternative is chosen in the ROD. These actions were all developed or mandated to avoid, minimize, or reduce impacts to resources, and they are required for implementation of the Project on BLM and USFS lands.

Design features are environmental protection measures that TransWest voluntarily has proposed to minimize and/or avoid resource impacts regardless of land jurisdiction. TransWest has committed to review and augment the list of applicant-committed design features as needed to minimize impacts to the extent possible, as well as to ensure conformance with all pertinent RMPs and LRMPs. A description of the current applicant-committed design features organized by major resource topics and project phase is found in **Appendix C**.

BMPs from the BLM FO RMPs and standards and guidelines from the USFS LRMPs are general requirements that minimize environmental impacts by ensuring compliance with laws, agency policies, and regulatory requirements. BMPs required by land use plans are not included in **Appendix C** as the list is extensive and many of those requirements are addressed by the applicant-committed design features presented in **Appendix C**. Further information regarding these BMPs can be found in the respective RMPs and LRMPs listed in **Tables 1-3** and **1-4**.

Required stipulations are resource- or area-specific conditions related to surface disturbing activities required for any permitted project on BLM or USFS lands. BLM and USFS stipulations are specific to each forest and BLM FO. Stipulations are described in **Appendix C**, and locations along the Project alternatives identified as no surface use areas are depicted in **Figures 2-12** through **2-15**. Details regarding the effectiveness of these stipulations in addressing resource impacts can be found in the respective Final EIS analyses for the RMPs and the LRMPs listed in **Tables 1-3** and **1-4**. Specific disclosure of the effects of these stipulations on impacts of this Project is provided by resource area in Chapter 3.0 of this EIS.

2.4.3 Facilities Common to All Action Alternatives

Several facilities would be required regardless of the action alternative selected. Terminals and ground electrode sites would be located at both the northern and southern ends of the Project. The following sections provide a summary of these facilities. A detailed description of these facilities is provided in the PDTR (**Appendix D**).

2.4.3.1 Northern and Southern Terminals

Northern and Southern terminals would be required for all transmission line action alternatives. The Northern Terminal would be located approximately 3 miles southwest of Sinclair, Wyoming; the Southern Terminal would be located at the Marketplace Hub in the Eldorado Valley, approximately 15 miles southwest of the metropolitan area of Boulder City, Nevada. Design Option 2 would require that the Southern Terminal be relocated to the IPP in Millard County near Delta, Utah. Design Option 3 would require an AC substation be constructed at the IPP site.

The terminal stations would include an AC/DC converter station and adjacent AC substation. The AC/DC converter station would include a 600-kV DC switchyard; AC/DC conversion equipment; transformers; and multiple equipment, control, maintenance, and administrative buildings.

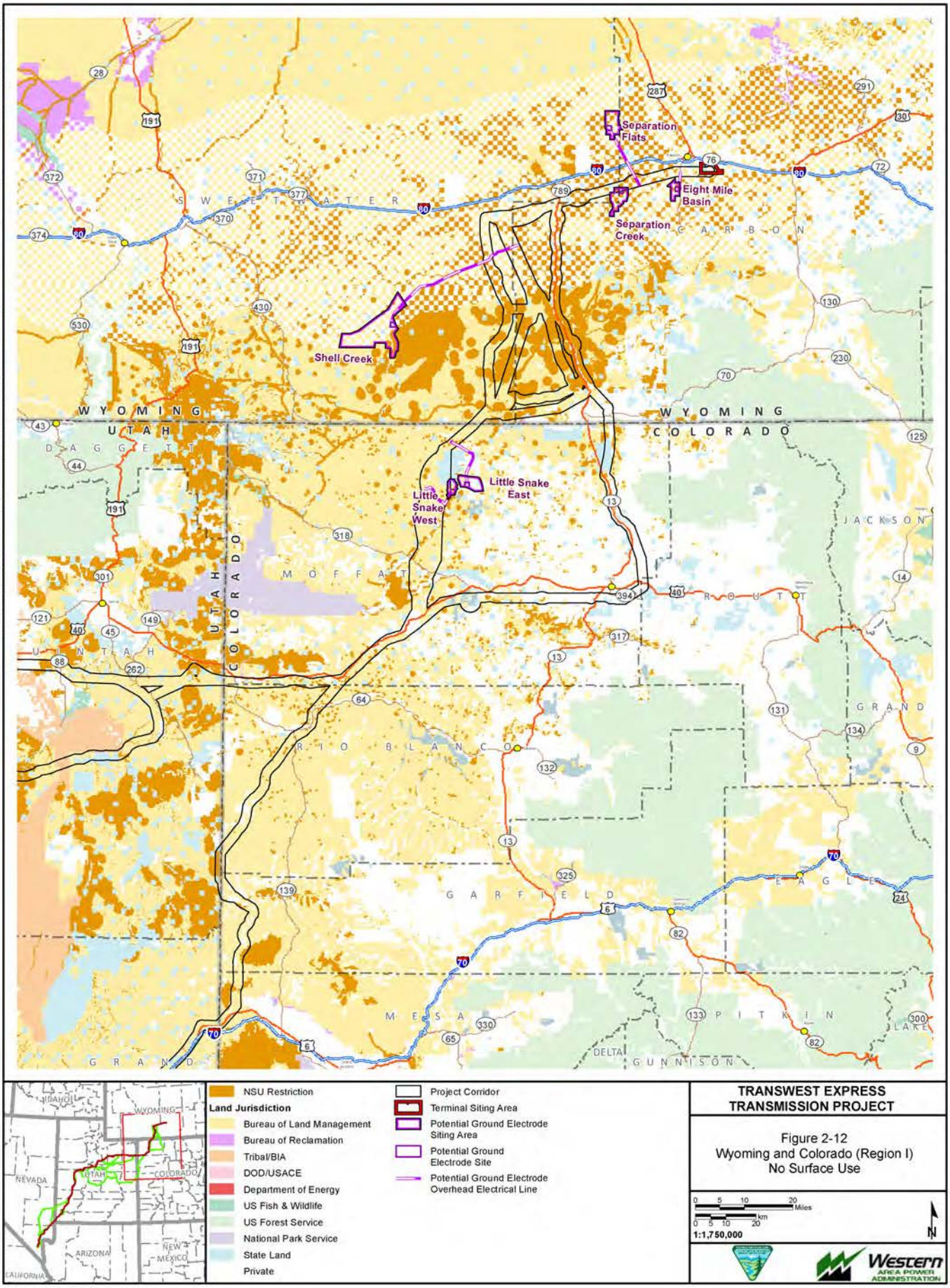


Figure 2-12
Wyoming and Colorado (Region I)
No Surface Use

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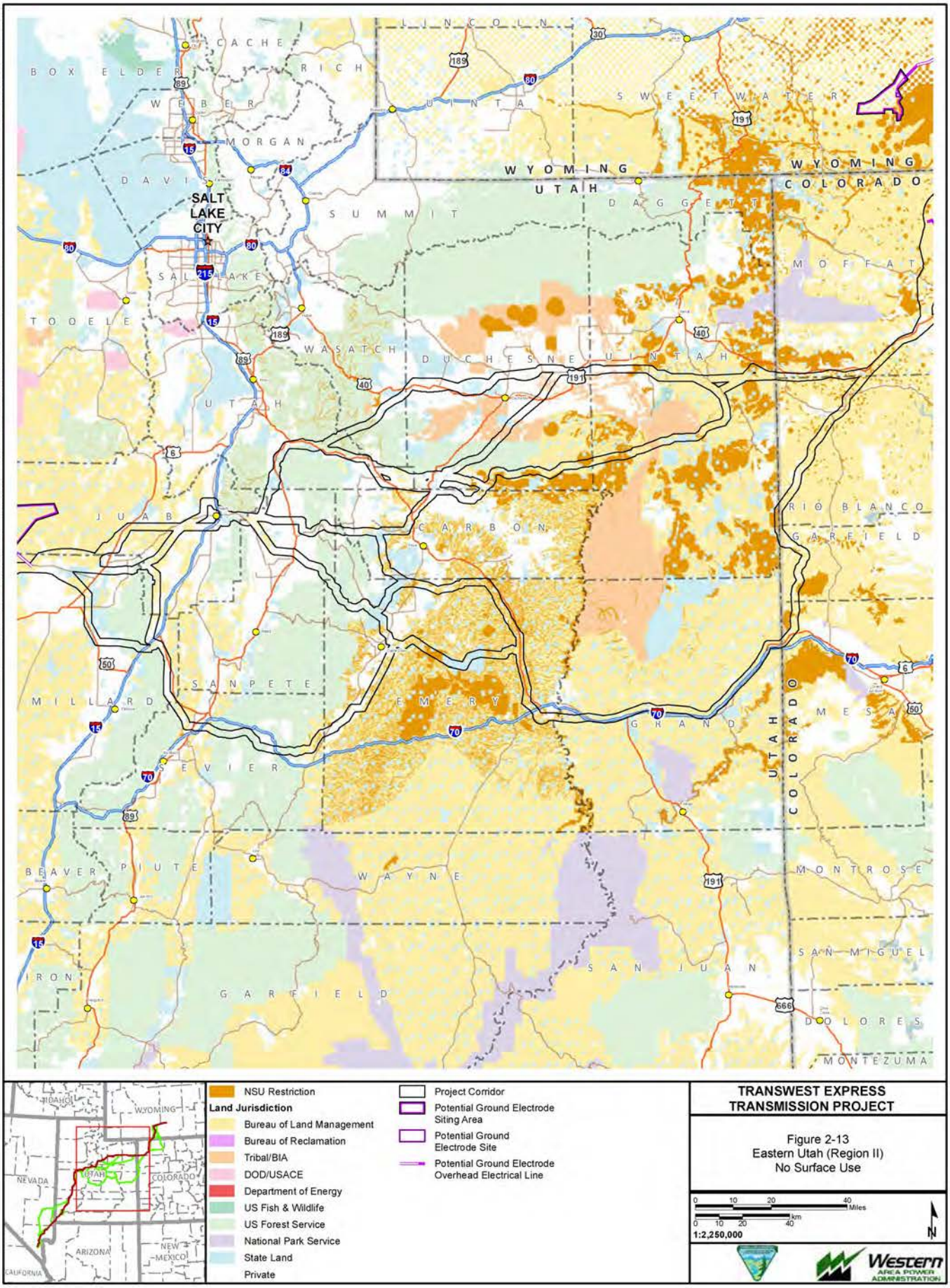

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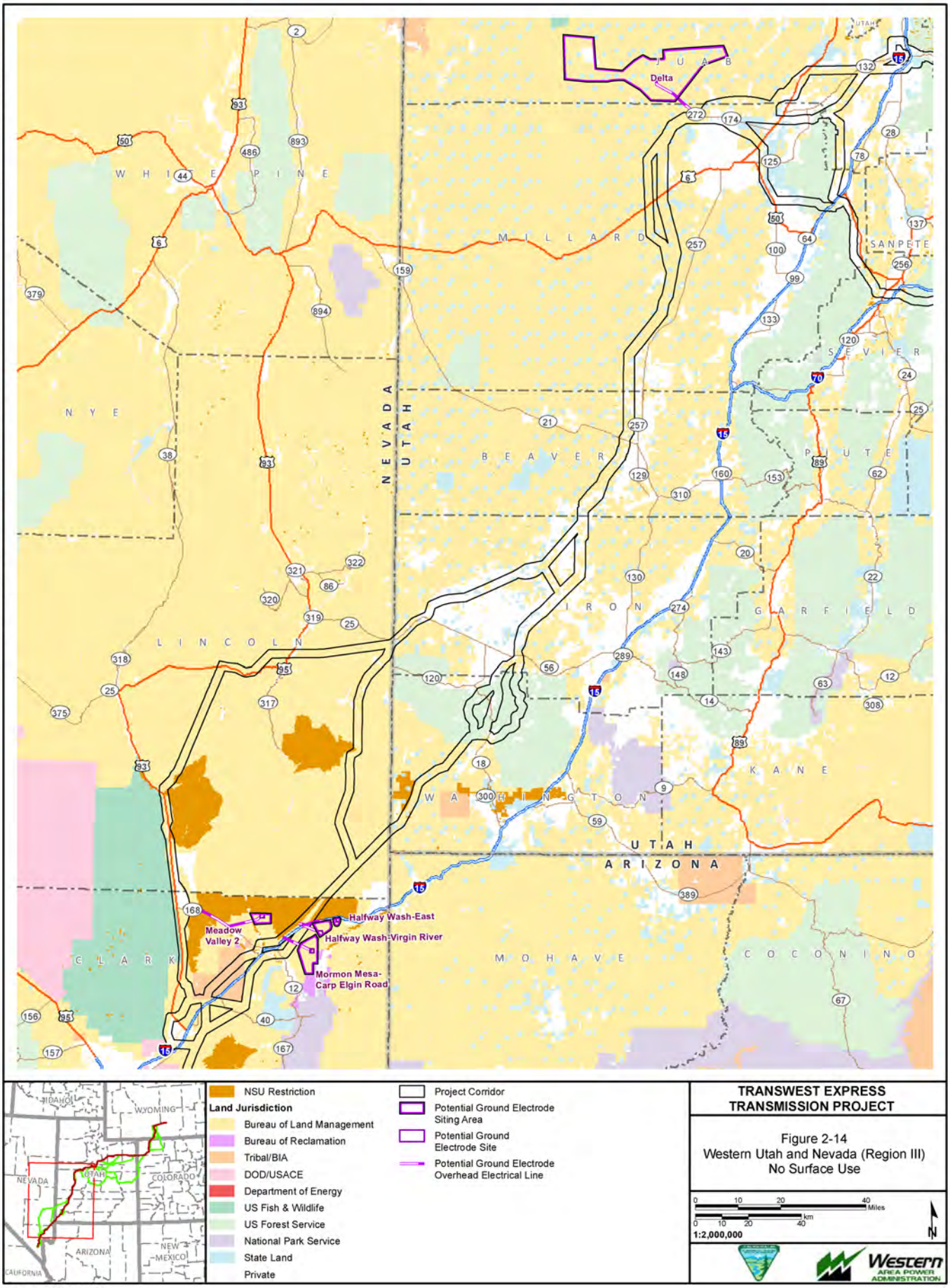

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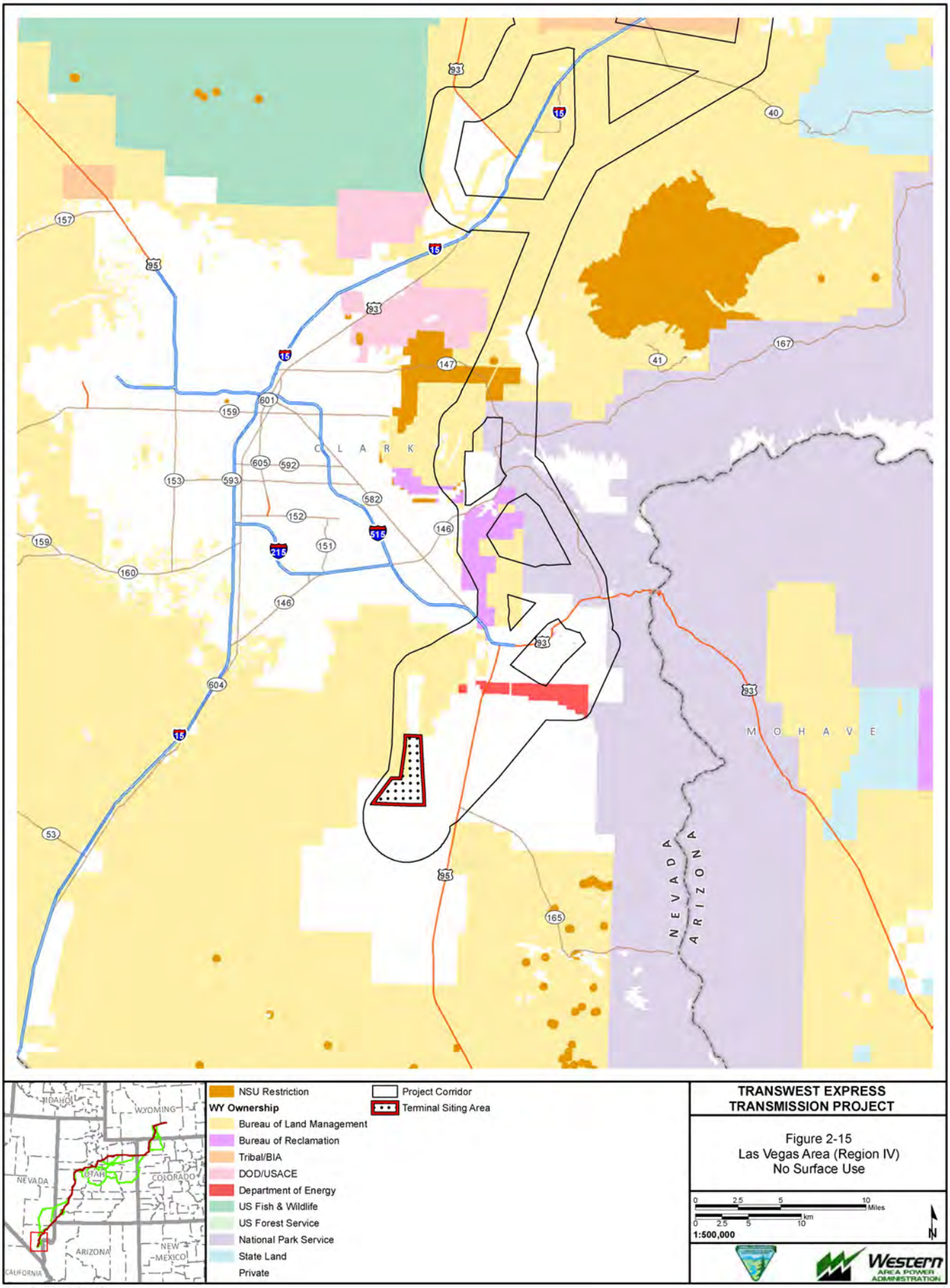

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Two buildings would house the AC/DC conversion equipment, each approximately 200 feet long by 80 feet wide and 60 to 80 feet high. Smaller buildings would house the control room, control and protection equipment, auxiliary equipment, and cooling equipment. The AC substation at the Northern Terminal would be a 500-/230-kV substation, and the AC substation at the Southern Terminal would be a 500-kV substation. The AC substations would include a switchyard, transformers, control equipment, and control buildings. Connections to the existing transmission infrastructure also would be constructed. **Table 2-1** summarizes the general terminal facility lengths and areas of disturbance.

Table 2-1 Terminal Facility Lengths and Areas of Disturbance

	Length (miles)		Construction Disturbance (acres)				Operation Disturbance (acres)			
Terminal	Inter-connection T-Lines	Access Roads	Converter, Substation, Switchyard	Inter-connection T-Lines	Access Roads	Total	Converter, Substation, Switchyard	Inter-connection T-Lines	Access Roads	Total
Northern	13	17	198	264	43	504	190	1	43	234
Southern and Southern Alternative	5	26	148	204	60	412	140	3	60	203
Southern near IPP (Design Option 2)	5	7	98	56	28	181	90	<1	28	118
Substation near IPP (Design Option 3)	5	7	83	56	23	161	75	<1	23	98
Series Compensation Station (Design Options)	N/A	N/A	18	N/A	5	23	10	N/A	5	15

Northern Terminal

The Northern Terminal facilities would be located on private lands in Carbon County, Wyoming, approximately 3 miles southwest of the town of Sinclair, Wyoming (**Figure 2-16**). The Northern Terminal would connect to the existing Platte – Point of Rocks 230-kV line located within 1 mile of the terminal. If needed, the Northern Terminal also could connect to the Energy Gateway West and Energy Gateway South 500-kV transmission lines currently proposed by PacifiCorp. TransWest requested an interconnection with both projects from PacifiCorp in 2009. Based on the current alternative routes being analyzed in the respective NEPA processes for the Energy Gateway West and Energy Gateway South projects, it is reasonably foreseeable that the interconnections between these two projects and the proposed Project would be at the Northern Terminal. The Northern Terminal would require the following components:

- An AC/DC converter station (a 600-kV DC switchyard and a converter building containing electronics and control equipment) approximately 30 acres in size.
- A 500-/230-kV AC substation approximately 135 acres in size.
- A 230-kV AC substation approximately 25 acres in size.
- An electrical connection from the AC/DC converter station to the 600-kV DC transmission line connecting to the Southern Terminal. All facilities for this connection are incorporated into the 600-kV DC transmission line.
- Two electrical connections from each (four connections total) of the proposed single circuit Energy Gateway West and Energy Gateway South 500-kV transmission lines (if approved) to the 500-/230-kV substation. These connections would connect the Northern Terminal to both the Aeolus and Anticline substations via the Energy Gateway West and Energy Gateway South 500-kV transmission lines (if approved). These two connections may require 500-kV transmission facilities, approximately 4 miles total or less in length, to connect the 500-/230-kV substation to the route of the Energy Gateway South 500-kV transmission line (if approved).

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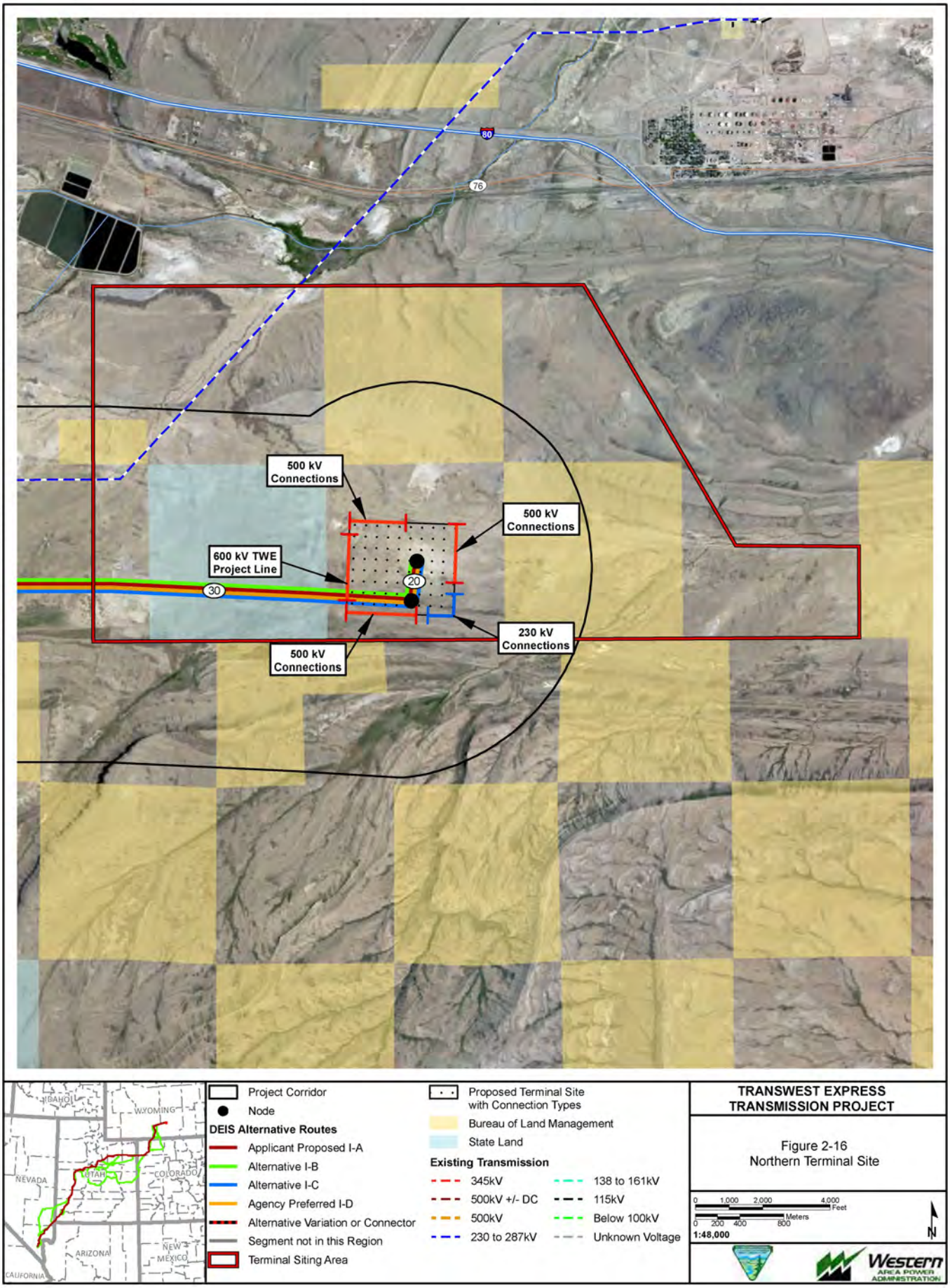

- Two electrical interconnections to the existing Platte – Point of Rocks 230-kV line, which would be rerouted into and out of the 230-kV substation. This 230-kV connection is assumed to require approximately 4 miles or less of double circuit 230-kV transmission line.
- Up to six electrical interconnections from proposed and planned generation facilities by 230-kV transmission lines.

The three major components of the Northern Terminal (AC/DC converter station, 500-/230-kV AC substation, and 230-kV AC substation) would be co-located and contiguous. Although these three components would be stand-alone facilities and could be located on separate parcels connected together by short transmission lines, it is common practice and preferable for the AC/DC converter station and 500-/230-kV AC substation(s) to be adjacent to each other. It also is preferable to locate the 230-kV AC substation next to the 500-kV AC substation. However, depending on the availability of space and other constraints in this area, these stand-alone facilities could be separated by a distance of up to 2 miles.

Southern Terminal

The Southern Terminal facilities would be located in the Eldorado Valley on private or public land, approximately 15 miles south of Boulder City, in Clark County, Nevada (**Figure 2-17**). Two alternative sites are being analyzed for the Southern Terminal in the Eldorado Valley; either would contain the same facilities. The Southern Terminal would connect to all four of the existing 500-kV substations (Eldorado, Marketplace, Mead, and McCullough) located at the Marketplace Hub.

The Southern Terminal would require the following components:

- An AC/DC converter station (a 600-kV DC switchyard and a converter building containing power electronics and control equipment) approximately 30 acres in size.
- A 500-kV AC substation approximately 110 acres in size.
- An electrical connection from the AC/DC converter station to the 600-kV DC transmission line. All facilities for this connection would be incorporated into the 600-kV DC transmission line.
- Two electrical connections from the existing Mead – Marketplace 500-kV transmission line to the new 500-kV AC Substation. These connections would connect the Southern Terminal to both the Mead and Marketplace substations via the existing Mead – Marketplace 500-kV transmission line. These two connections may require 500-kV transmission facilities, assumed to total 4 miles or less in length, to connect the new 500-kV AC substation to the existing Mead – Marketplace 500-kV transmission line.
- Construction of 500-kV transmission line from the new 500-kV AC substation to each of the Eldorado and McCullough substations. These single circuit 500-kV transmission lines are each estimated to be 5 miles or less in length.
- Although not anticipated at this time, one or more of the existing 138-/230-kV lines within the Proposed Terminal Siting Area may need to be re-routed/re-configured to accommodate the Southern Terminal due to congestion within the area. If necessary, this reroute or reconfiguration of 138-/230-kV transmission line facilities is not anticipated to impact more than a total of 3 miles of existing lines.

The two major components of the Southern Terminal (AC/DC converter station and the 500-kV AC substation) would be co-located and contiguous. Although these two components would be stand-alone facilities and could be located on separate parcels connected together by short transmission lines, it is common practice and preferable for the AC/DC converter station and 500-kV AC substation to be adjacent to each other.

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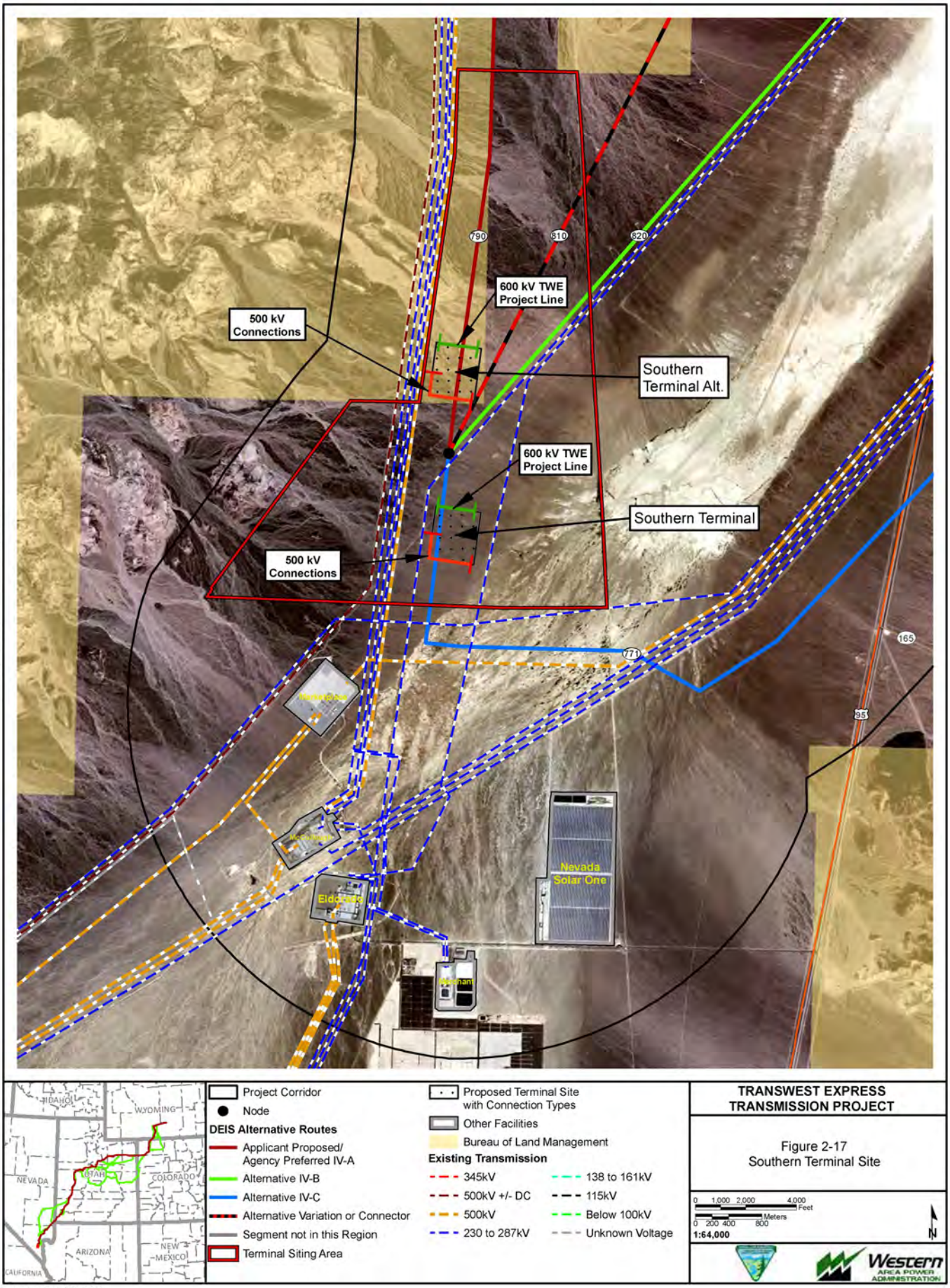

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If Design Option 2 were implemented, the Northern Terminal would be constructed as in the proposed action. The Southern Terminal would be constructed near IPP instead of in Nevada (**Figure 2-2** and **Figure 2-18**). Facilities would be similar to those described above, and are as follows;

- An AC/DC converter station and an adjacent 500-/345-kV AC substation near the IPP in Millard County, Utah; and
- A double circuit 345-kV AC line (approximately 5 miles) between the new 500-/345-kV AC substation near IPP to the existing IPP 345-kV AC substation adjacent to the existing IPP AC/DC converter station.

If Design Option 3 were implemented, a substation would be constructed near IPP under phase one, and the Southern Terminal would be constructed in Nevada under phase two (**Figure 2-3** and **Figure 2-19**). The Northern Terminal would be constructed under phase two and configured as in the proposed action. Facilities would be similar to those described above, and are as follows;

- A 500-/345-kV AC substation near the IPP in Millard County, Utah; and
- A double circuit 345-kV AC line (approximately 5 miles) between the new 500-/345-kV AC substation near IPP to the existing IPP 345-kV AC substation adjacent to the existing IPP AC/DC converter station.

2.4.3.2 Ground Electrode Systems

One ground electrode facility consisting of a small above-ground building and surrounding underground electrode bed wells (see **Figure 2-20** and additional description in **Appendix D**) would be required within approximately 100 miles of each of the Northern and Southern terminals. This would establish and maintain electrical current continuity during normal operations and during any unexpected outage of one of the two poles (or circuits) of the 600-kV DC terminal or converter station equipment. The specific location of the ground electrode systems would be identified during final engineering and design; however, general siting areas and conceptual alternative site locations have been identified in Regions I and III and have been analyzed in this EIS. Additionally, the lower voltage connector lines from the 600-kV DC transmission line to each of the conceptual ground electrode sites have been analyzed. The alternative route selected would influence which set of ground electrode location alternatives could be considered for use; therefore, the alternative ground electrode facilities are discussed in the following regional descriptions and depicted in the regional alternative figures.

2.5 Alternative Transmission Line Routes and Ancillary Facilities

The Project has been split into four distinct regions, each of which would require independent alternatives decisions regarding transmission line routing based on region-specific topographical or resource constraints. The alternative transmission line routes are depicted by region in **Figure 2-21** through **Figure 2-24**. The alternatives within each of these regions can be combined to define a distinct end-to-end route from Wyoming to Nevada.

Each alternative route is further defined by a reference line. Transmission reference lines for each route have been considered as buildable locations within each corridor and represent the location of the transmission line centered within a nominal 250-foot-wide transmission line ROW. As representations of the likely location of the transmission line, reference lines provide a basis for quantifying and comparing the range and degree of impacts associated with the various alternatives. The impacts consider topographical constraints, existing transmission lines, and resource constraints within the 2-mile transmission line corridor. Ongoing refinements are being considered during the NEPA process, and are referred to as micro-siting options to the reference line. These micro-siting options represent adjustments that remain within the Project 2-mile transmission line corridor in areas requested by the agencies to minimize resource or siting constraints. Final transmission line

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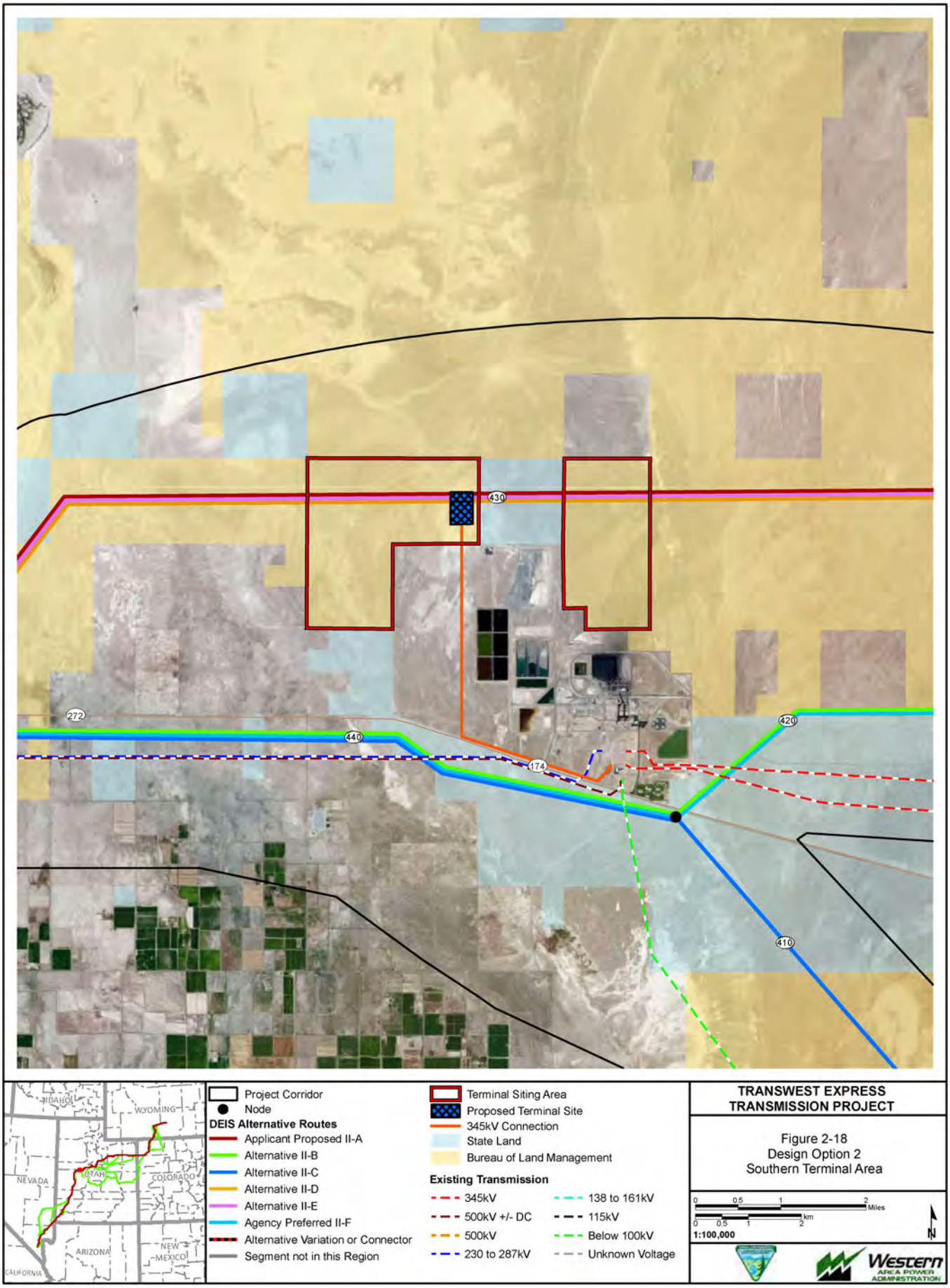

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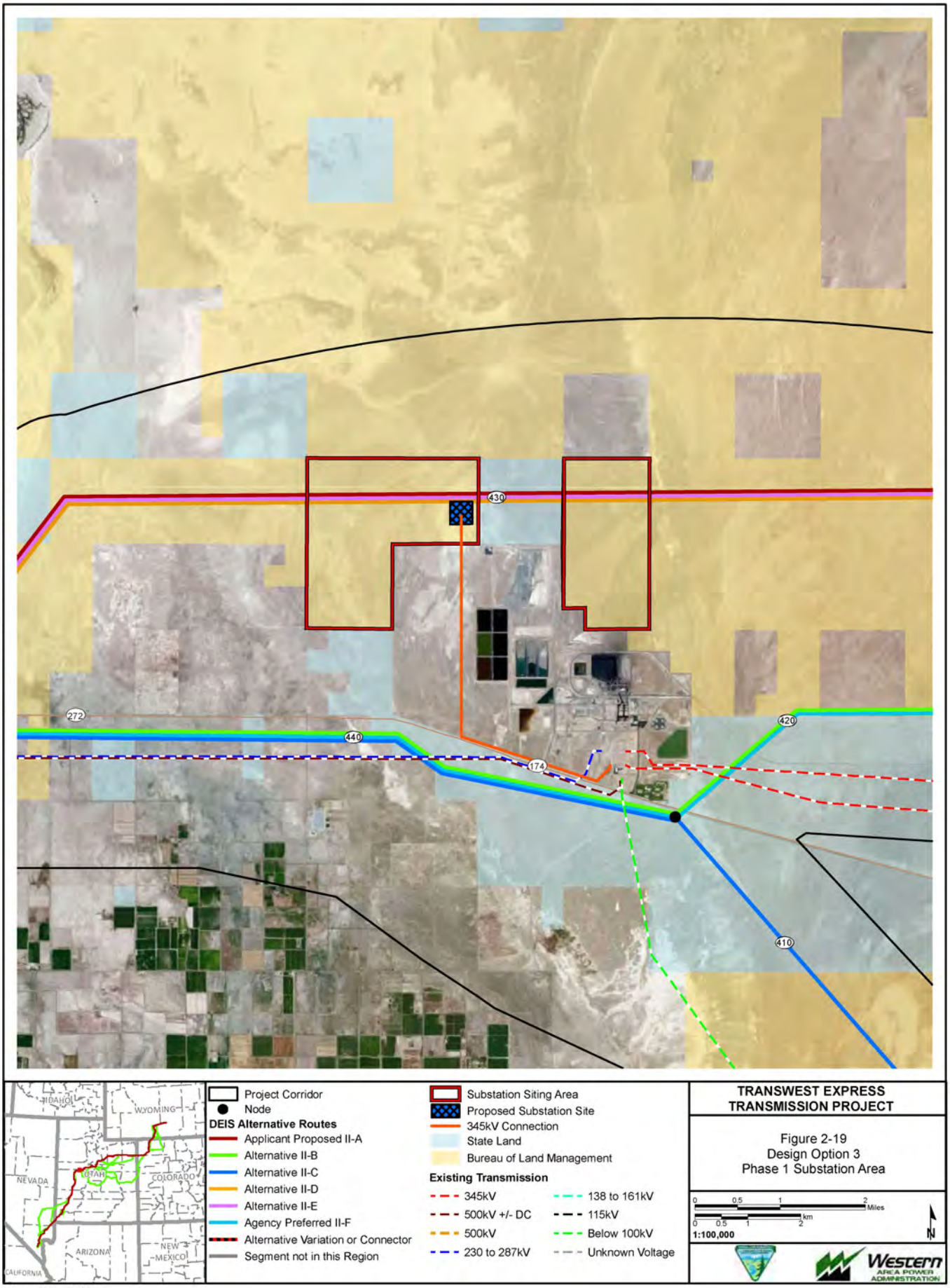

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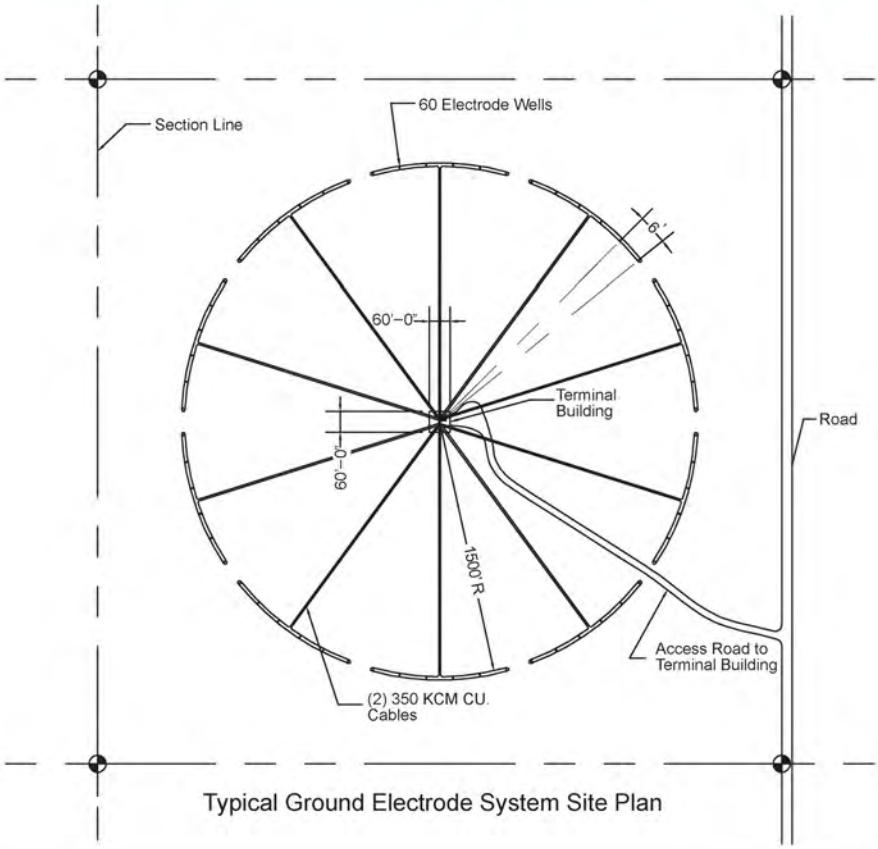
A

Typical Above Ground Installation at the Ground Electrode Facility

B



Typical Ground Electrode System Site Plan

Source: TWE 2011

Transwest Express Transmission Project

Figure 2-20
Typical Ground Electrode System Above Ground Installation and Site Plan

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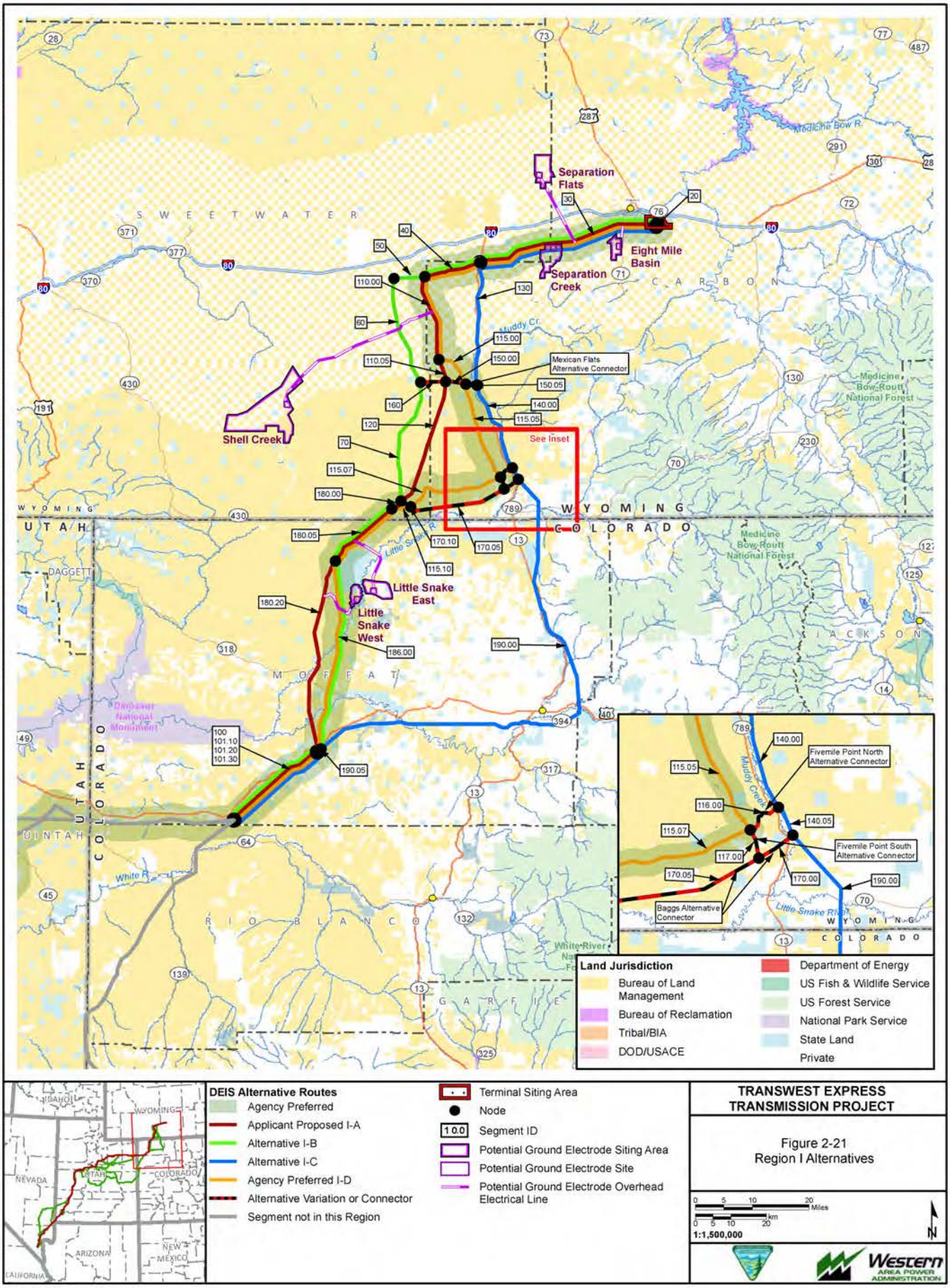

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 2-21
Region I Alternatives

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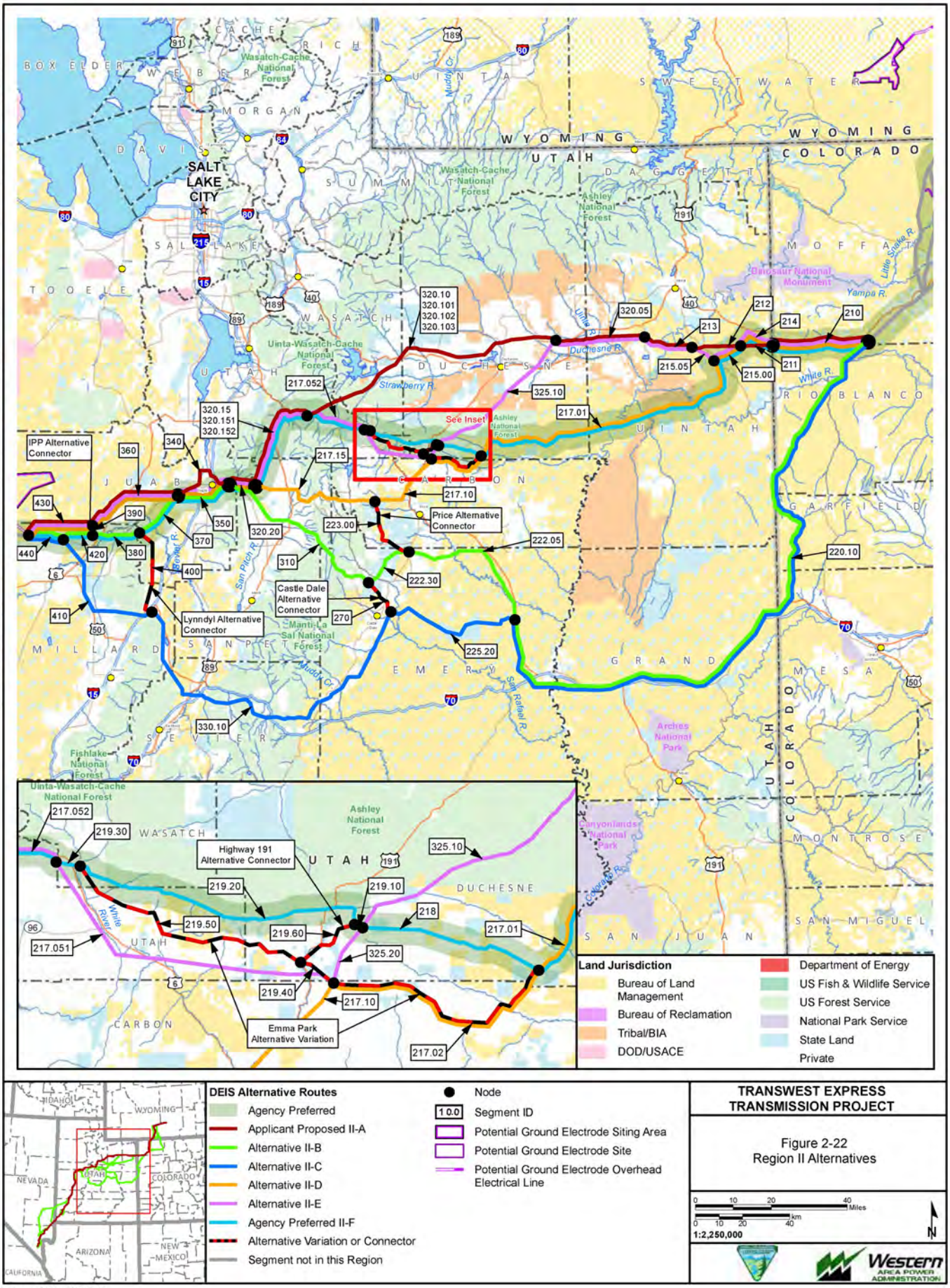

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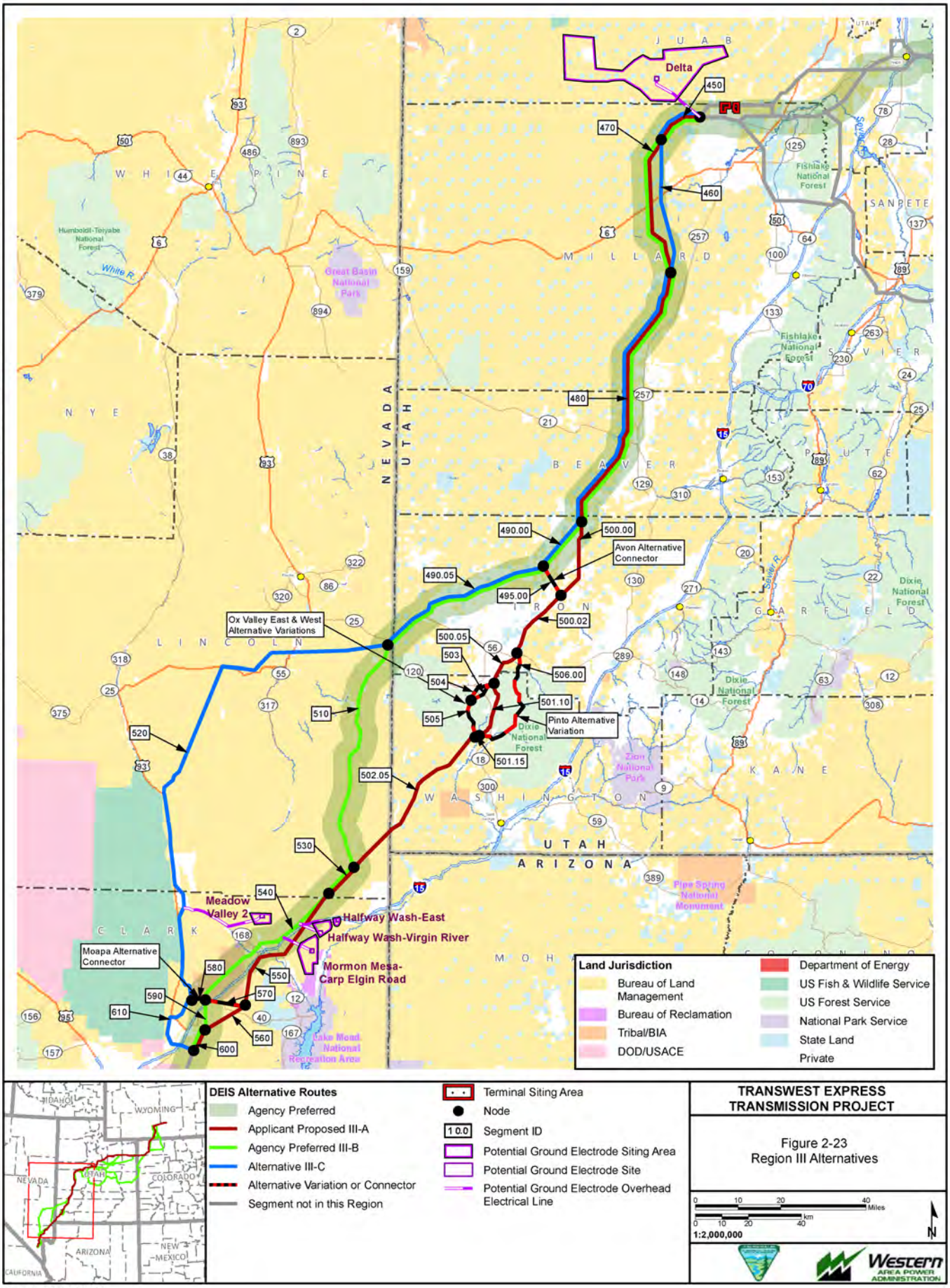

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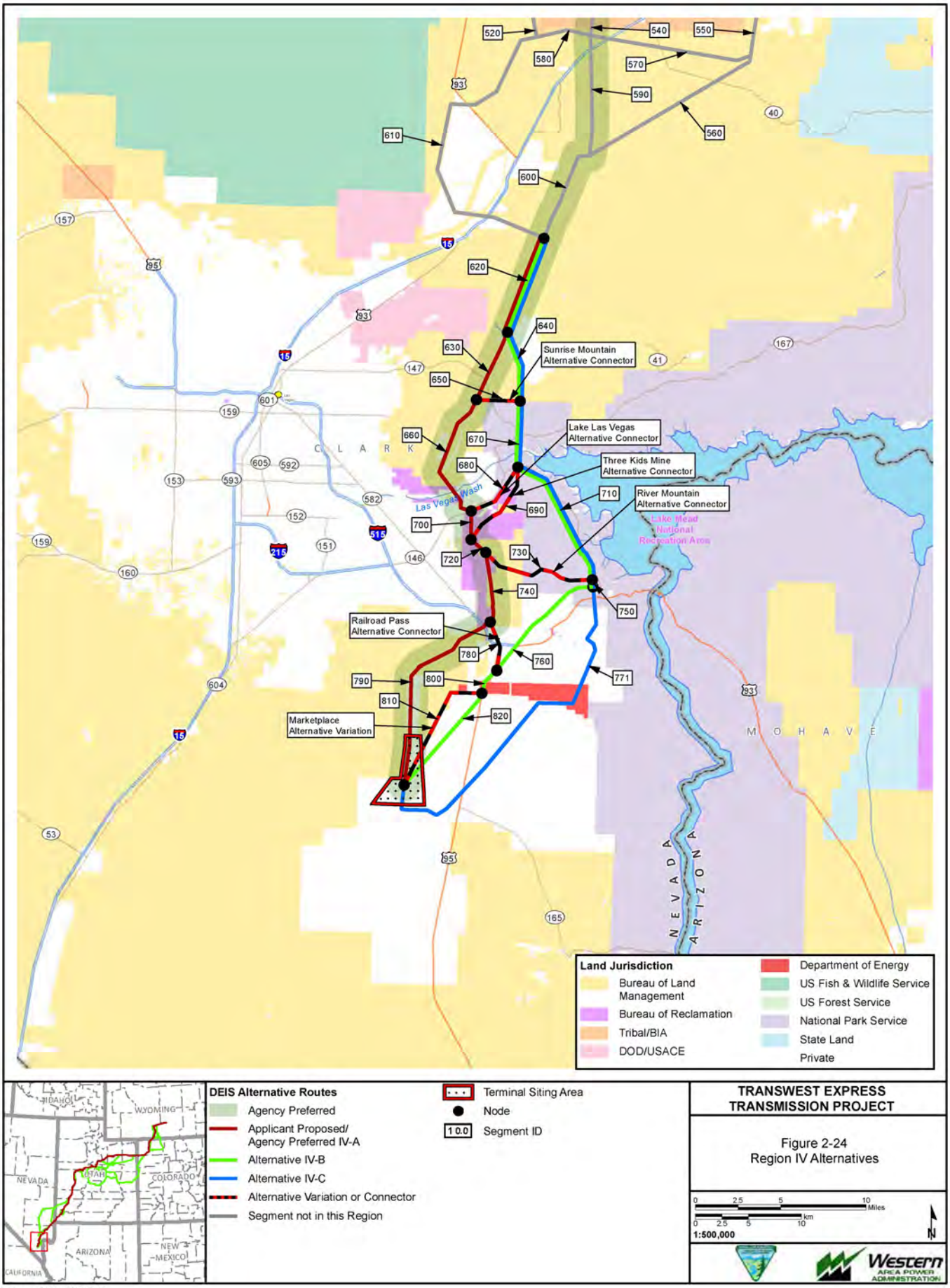

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alignments and 250-foot-wide transmission line ROW locations would be determined during final engineering and design and may vary from the reference lines presented in this document. However, any alignment changes must remain within the 2-mile transmission line corridor and comply with all avoidance, minimization, and mitigation requirements described in this EIS, pertinent BLM RMPs, and USFS LRMPs.

To facilitate alternatives discussion and impacts disclosure in this EIS, segments were defined between nodes or points where reference lines diverge and/or converge within a region. Each of these segments was given a unique identification number as listed in **Table 2-2**. The identification numbers generally were assigned beginning in the northeast and moving to the southwest. These segments were grouped within the regions to create alternative comparisons from the beginning point in each region to the ending point in the same region. Because there are locations in each region where multiple alternatives overlap, some segments are analyzed multiple times as part of each alternative (e.g., segments 20, 30, and 40 in Region I). Summaries of alternative transmission line routes, associated access road lengths, and disturbance areas are included in the regional descriptions below.

Table 2-2 Reference Line Segments Comprising Alternative Routes by Region

Region	Applicant Proposed Alternative A Segment IDs	Alternative B Segment IDs	Alternative C Segment IDs	Alternative D Segment IDs	Alternative E Segment IDs	Alternative F Segment IDs
I	I-A 20, 30, 40, 110.00, 110.05, 120, 180.00, 180.05, 180.20, 100	I-B 20, 30, 40, 50, 60, 70, 180.00, 180.05, 186, 190.05, 100	I-C 20, 30, 130, 140.00, 140.05, 190.00, 190.05, 100	I-D *Agency Preferred Alternative* 20, 30, 40, 110.00, 115.00, 115.05, 115.07, 115.10, 180.05, 186, 190.05, 100	Not Applicable in Region I	Not Applicable in Region I
II	II-A 210, 211, 212, 213, 320.05, 320.10, 320.15, 320.20, 340, 360, 430	II-B 220.10, 222.05, 222.3, 310, 350, 370, 380, 420, 440	II-C 220.10, 225.2, 330.10, 410, 440	II-D 210, 214, 215.00, 217.01, 217.02, 217.10, 217.15, 320.20, 350, 360, 430	II-E 210, 214, 215.00, 215.05, 213, 320.05, 325.1, 325.2, 217.051, 217.052, 320.15, 320.20, 350, 360, 430	II-F *Agency Preferred Alternative* 210, 214, 215.00, 217.01, 217.052, 218.00, 219.10, 219.20, 219.30, 320.15, 320.20, 350, 370, 380, 420, 440
III	III-A 450, 470, 480, 500.00, 500.02, 500.05, 501.10, 501.15, 502.05, 530, 550, 560, 600	III-B *Agency Preferred Alternative* 450, 460, 480, 490.00, 490.05, 510, 530, 540, 590, 600	III-C 450, 460, 480, 490.00, 490.05, 520, 610	Not Applicable in Region III	Not Applicable in Region III	Not Applicable in Region III
IV	IV-A *Agency Preferred Alternative* 620, 630, 660, 700, 720, 740, 790	IV-B 620, 640, 670, 710, 750, 760, 800, 820,	IV-C 620, 640, 670, 710, 750, 771	Not Applicable in Region IV	Not Applicable in Region IV	Not Applicable in Region IV

Also, individual impact descriptions or comparisons of shorter sections have been considered in locations where alternative variation possibilities are shorter in length than the entire region or where segments act as

alternative connectors. **Table 2-3** lists the alternative variations and micro-siting options that have been considered by region. Alternative variation impacts are described and directly compared to alternative routes that begin and end in the same locations as the variation. The segments that make up the alternative variation and those used to directly compare the variation to an alternative route are included in **Table 2-3**. **Table 2-4** lists the alternative connectors that have been considered by region. The direct comparison of impacts from alternative connectors in relation to segments of the alternative routes is not as simple. The ability to combine connectors with different segment routes allows for a large number of distinct alternative routes.

Table 2-3 Alternative Variations and Micro-siting Options Considered by Region

Region	Alternative Variation or Micro-siting Option		Comparison	Alternative(s) Necessary for Variation	
	Name	Segment IDs	Segment IDs	Beginning	Ending
I	Tuttle Easement Micro-siting Option 1	101.1	100.00, 186.00	I-D	I-D
I	Tuttle Easement Micro-siting Option 2	101.2	100.00, 186.00	I-D	I-D
I	Tuttle Easement Micro-siting Option 3	101.3	100.00, 186.00	I-D	I-D
II	Emma Park Alternative Variation	217.02, 219.40, 219.50	218.00, 219.10, 219.20, 219.30	II-F	II-F
II	Strawberry IRA 1 Micro-siting Option 1	320.101	320.10	II-A	II-A
II	Strawberry IRA 2 Micro-siting Option 2	320.102	320.10	II-A	II-A
II	Strawberry IRA 3 Micro-siting Option 3	320.103	320.10	II-A, II-E, II-F	II-A, II-E, II-F
II	Cedar Knoll IRA 1 Micro-siting Option 1	320.151	320.15	II-A, II-E, II-F	II-A, II-E, II-F
II	Cedar Knoll IRA 2 Micro-siting Option 2	320.152	320.15	II-A, II-E, II-F	II-A, II-E, II-F
III	Ox Valley East Alternative Variation	503, 505	501.10, 501.15	III-A	III-A
III	Ox Valley West Alternative Variation	504, 505	501.10, 501.15	III-A	III-A
III	Pinto Alternative Variation	506.00	500.05, 501.10	III-A	III-A
IV	Marketplace Alternative Variation	810	820	IV-B	IV-A, IV-B

Table 2-4 Alternative Connectors Considered by Region

Region	Alternative Connector		Alternative(s) Necessary for Connector	
	Name	Segment IDs	Beginning	Ending
I	Mexican Flats Alternative Connector	150.00, 150.05, 160	I-All	I-All
I	Baggs Alternative Connector	170.00, 170.05	I-C	I-A, I-B
I	Fivemile Point North Alternative Connector	116	I-D	I-C
I	Fivemile Point South Alternative Connector	117	I-D	Baggs Alternative Connector
II	Highway 191 Alternative Connector	219.60	II-F	Emma Park Alternative Variation
II	Castle Dale Alternative Connector	270	II-C	II-B
II	Price Alternative Connector	223.00	II-B	II-D
II	Lynndyl Alternative Connector	400	II-C	II-B
II	IPP East Alternative Connector	390	II-B, II-C	II-B, II-C
III	Avon Alternative Connector	495.00	III-B, III-C	III-A
III	Moapa Alternative Connector	570, 580	III-All	III-All

Table 2-4 Alternative Connectors Considered by Region

Region	Alternative Connector		Alternative(s) Necessary for Connector	
	Name	Segment IDs	Beginning	Ending
IV	Sunrise Mountain Alternative Connector	650	IV-B, IV-C	IV-A
IV	Lake Las Vegas Alternative Connector	680	IV-B, IV-C	IV-A
IV	Three Kids Mine Alternative Connector	690	IV-B, IV-C	IV-A
IV	River Mountains Alternative Connector	730	IV-B, IV-C	IV-A
IV	Railroad Pass Alternative Connector	780	IV-B	IV-A, IV-B

Note: The impacts of using connectors will be described; however, the impacts of the alternatives they connect are disclosed in the alternatives' respective discussions.

An analysis of all distinct alternative and connector potential route combinations would result in the detailed analysis of several route combinations with virtually identical impacts. Accordingly, Chapter 3.0 discloses the impacts of connectors independently, allowing the reader to determine potential additive impacts of the connectors across alternative combinations.

2.5.1 Alternative Transmission Line Routes and Ancillary Facilities by Region

The length and surface disturbance from the applicant-proposed and other alternatives are described in this section. This includes transmission line alternative routes, variations, connectors, and ground electrode systems. Facilities considered part of the construction disturbance for each alternative include access roads, structure erection sites, communication sites, line stringing and tensioning sites (both transmission and communication), and other temporary work areas (i.e., staging areas, concrete batch plants, storage yards, helicopter fly yards). Facilities considered part of operation and maintenance disturbance include access roads, structure foundation sites, and communication sites. These construction and operation areas generally would experience sub-grade disturbance to provide clear, flat work spaces. All construction disturbance not included in operation disturbance (e.g., stringing and tensioning sites, work areas, decrease in structures and communication sites) would be reclaimed after construction was completed. Areas within the ROW that are not included in the disturbance area for construction or operation facilities may experience vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction. As such, these areas are reported as additional ROW vegetation clearing. Ground electrode systems would be necessary in Regions I and III. **Appendix D** contains additional information on the above facilities and their associated disturbances.

2.5.1.1 Region I: Sinclair, Wyoming to Northwest Colorado near Rangely, Colorado

Region I alternatives are depicted on **Figure 2-21**. Alternative I-D is the agency preferred alternative in Region I. The length of alternative routes and associated access roads in Region I are summarized in **Table 2-5** and the disturbance associated with construction and operation of each is summarized in **Table 2-6**. If Design Option 3 were implemented, the transmission lines in this region would be constructed with an AC configuration (three conductors and structures to support them) for AC operation during phase one of Project implementation (see **Figure 2-3**).

Table 2-5 Length of Alternative Routes and Associated Access Roads in Region I

Regional Alternative	Length (Miles)			
	I-A	I-B	I-C	I-D
600kV T-Line	155	159	186	171
Access Roads	227	223	269	242

Table 2-6 Transmission Line Alternative Route Areas of Disturbance in Region I

Facilities	Construction Disturbance (acres)				Operation Disturbance (acres)			
	Alt. I-A	Alt. I-B	Alt. I-C	Alt. I-D	Alt. I-A	Alt. I-B	Alt. I-C	Alt. I-D
Access Roads	512	481	601	515	512	481	601	515
Structures and Communication Sites	718	734	863	793	14	14	17	16
Stringing and Tensioning Sites	456	487	600	587	0	0	0	0
Work Areas[1]	371	381	447	411	0	0	0	0
Facilities Total	**2,057**	**2,083**	**2,511**	**2,306**	**526**	**495**	**618**	**531**
Additional ROW-vegetation clearing[2]	3,242	3,304	3,848	3,500	0	0	0	0

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.
[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Alternative I-A (Applicant Proposed)

TransWest's proposed reference line would begin in Sinclair, Wyoming, and would travel west just south of the I-80 corridor to Wamsutter. At Wamsutter, it would turn south and generally follow the Carbon-Sweetwater county line along a corridor preferred by the Wyoming Governor's Office and Carbon and Sweetwater counties. It then would continue south-southwest across the Wyoming-Colorado state line and south along a corridor preferred by Moffat County where it would intersect with U.S. Highway 40 just west of Maybell, Colorado. The reference line generally would parallel U.S. Highway 40, turning west toward the Colorado-Utah border.

Alternative I-B

Alternative I-B was the TransWest original proposed action. It was subsequently withdrawn and replaced by a revised ROW application reflecting their current proposed action. It was retained as Alternative I-B because it would follow an existing utility corridor, thereby reducing the proliferation of new corridors. The alternative would be the same as Alternative I-A to Wamsutter, and then differ as Alternative I-B would continue west for several miles before turning south along the WWEC. Alternative I-B would follow the WWEC to near the Colorado state line, where it would converge with Alternative I-A for approximately 15 miles, then diverge to the south and parallel Alternative I-A to the east with an offset of approximately 5 miles. It then would intersect with U.S. Highway 40 and follow Alternative I-A to the end of Region I.

Alternative I-C

This alternative was developed to reduce the overall proliferation of utility corridors and associated impacts by following existing designated utility corridors. Alternative I-C would begin by following Alternative I-A to near Creston, Wyoming, where Alternative I-C would turn south and parallel Wyoming State Highway 789 toward Baggs, Wyoming. From there, Alternative I-C would continue south, deviating from Highway 789 to the east and passing east of Baggs. After crossing into Colorado, this alternative would parallel Colorado State Highway 13 into Craig, Colorado. Alternative I-C would pass east and south of Craig, turning to the west after crossing U.S. Highway 40, generally paralleling the highway and joining with Alternative I-A to the end of Region I.

Alternative I-D (Agency Preferred)

Alternative I-D was developed to reduce multiple resource concerns, including impacts to visual resources and greater sage-grouse. It would follow the route of Alternative I-A, going west from Sinclair, Wyoming (Carbon County, Wyoming), basically paralleling I-80 in the designated WWEC, until turning south near Wamsutter. It would follow Alternative I-A south for approximately 15 miles. Alternative I-D then would diverge to the east, where it generally would parallel Highway 789 at an offset distance of 2 to 5 miles to the west. Before reaching

the Baggs area, Alternative I-D would turn west and follow the Shell Creek Stock Trail road for approximately 20 miles, where it would cross into Sweetwater County and again join Alternative I-A while turning south into Colorado (Moffat County).

Tuttle Easement Micro-siting Options 1, 2, and 3

Three micro-siting options have been developed to address specific resource concerns in Region I (**Figure 2-25**). The Tuttle Easement micro-siting options 1, 2, and 3 address concerns related to the Tuttle Ranch Conservation Easement (see Section 3.14, Land Use). Tuttle Easement Micro-siting Option 1 would follow two existing transmission lines through the area (including the Tuttle Ranch Conservation Easement lands) with a 250-foot offset. Tuttle Easement Micro-siting Option 2 would avoid the Tuttle Ranch Conservation Easement and pass between where the easement and the NPS Dinosaur National Monument's Deerlodge Road intersects with U.S. Highway 40. Tuttle Easement Micro-siting Option 3 also would avoid the easement, but cross the NPS Deerlodge Road west of U.S. Highway 40. These micro-siting options are compared with the portion of Alternative I-D they might replace, but could be utilized with each of the alternatives in Region I. Because they are near each other and share a 2-mile transmission line corridor, resource impacts generally are similar to the other alternatives.

Region I Alternative Connectors

The Region I alternative connectors were developed to provide the flexibility to combine alternative segments to address resource conflicts. They are described below and depicted in **Figure 2-21**. The length of the alternative connectors and associated access roads along with construction and operation disturbance areas are summarized in **Table 2-7**.

Table 2-7 Alternative Connectors Areas of Disturbance in Region I

	Length (miles)		Construction Disturbance (acres)						Operation Disturbance (acres)		
Facilities	600-kV T-Line	Access Roads	Access Roads	Structures & Communication Sites	Stringing & Tensioning Sites	Work Areas[1]	Facilities Total	Additional ROW-Vegetation Clearing[2]	Access Roads	Structures & Communication Sites	Facilities Total
Mexican Flats	10	13	25	48	32	24	**129**	206	25	1	**26**
Baggs	22	31	68	104	68	54	**294**	464	68	2	**70**
Fivemile Point North	3	4	8	15	52	7	**82**	20	8	<1	**8**
Fivemile Point South	2	3	6	10	10	5	**31**	42	6	<1	**6**

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Mexican Flats Alternative Connector (All Alternatives)

The Mexican Flats Alternative Connector could be used to join all Region I alternatives to any of the other alternatives. The connector would be located in an area where the three alternatives are closest to one another, just south of the BLM-private checkerboard ownership pattern in Wyoming.

Baggs Alternative Connector (Alternative I-C only)

The Baggs Alternative Connector would connect Alternative I-C with Alternatives I-A and I-B between Baggs and the general location where Alternatives I-A and I-B cross the Wyoming-Colorado state line.

Fivemile Point North Alternative Connector (Alternatives I-C or I-D)

The Fivemile Point North Alternative Connector would connect Alternative I-D with Alternative I-C near Baggs.

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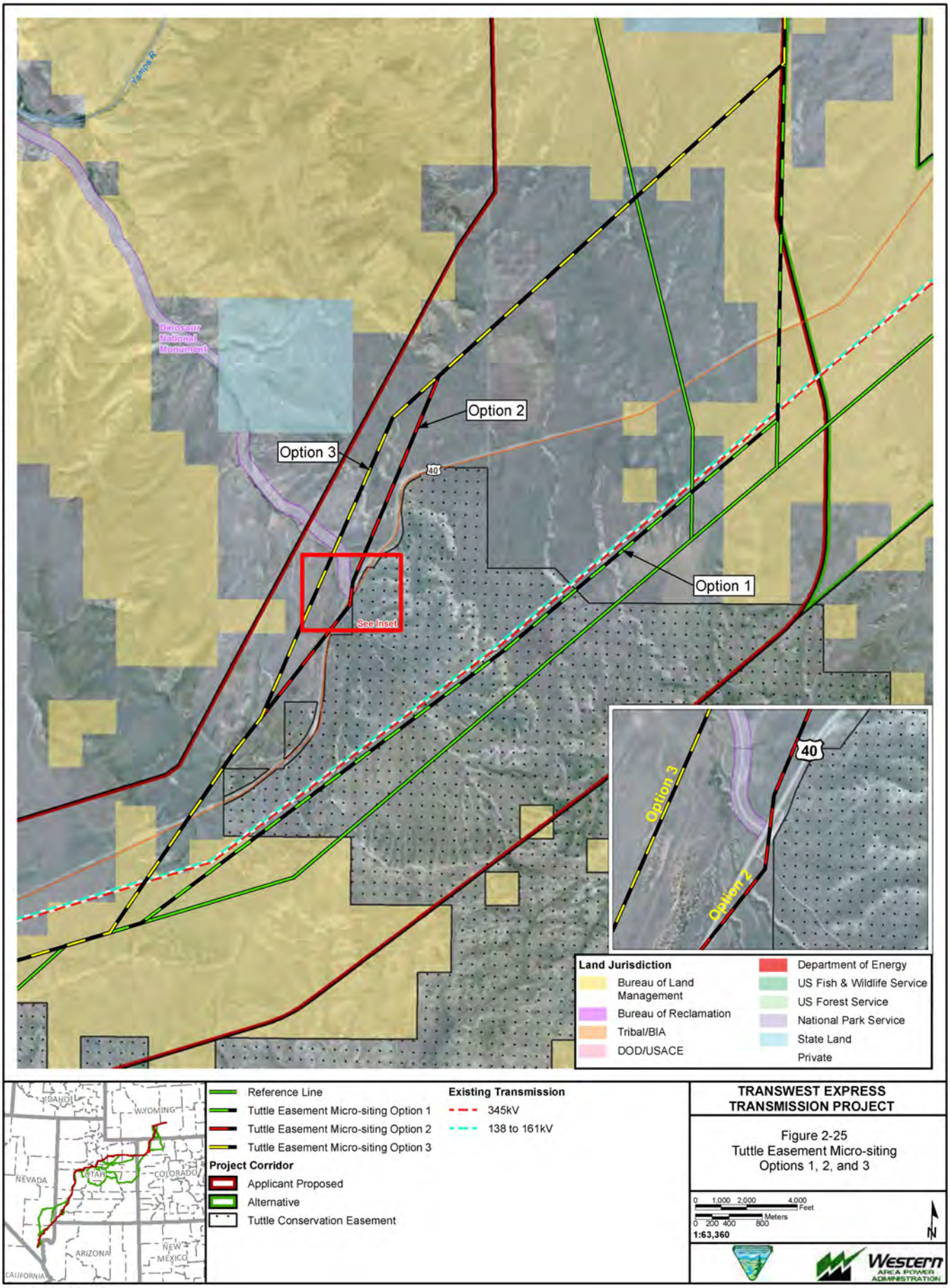

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 2-25
Tuttle Easement Micro-siting
Options 1, 2, and 3

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Fivemile Point South Alternative Connector (Alternative I-D or Baggs Alternative Connector)

The Fivemile Point South Alternative Connector would connect Alternative I-D with the Baggs Alternative Connector near Baggs.

Region I Ground Electrode System Alternative Facilities

The ground electrode system alternative locations in Region I are depicted in **Figure 2-21**, and the lengths and disturbance areas are summarized in **Table 2-8**. These alternative locations are dependent on the alternative route selected, as noted in **Table 2-8** with the alternatives listed in parentheses.

Table 2-8 Ground Electrode System Alternative Facility Lengths and Areas of Disturbance in Region I

Northern Ground Electrode System Site Alternatives[1]	Length (miles)		Construction Disturbance (acres)				Operation Disturbance (acres)			
	34.5 kV AC Overhead Line	Access Road	Ground Electrode Sites	Over-head Lines	Access Roads	Total	Ground Electrode Sites	Over-head Lines	Access Roads	Total
Separation Flat (All Alternatives)	13	17	65	30	34	128	6	<1	34	39
Shell Creek (Alternatives I-A and I-D)	33	43	65	75	83	223	6	<1	83	89
Little Snake East (Alternatives I-A, I-B, and I-D)	9	12	65	20	24	108	6	<1	24	29
Little Snake West (Alternative I-A)	10	14	65	25	31	121	6	<1	31	37
Shell Creek (Alternative I-B)	26	34	65	59	65	189	6	<1	65	71
Little Snake West (Alternatives I-B and I-D)	5	7	65	12	15	93	6	<1	15	21
Separation Creek (All Alternatives)	14	20	65	30	43	138	6	<1	43	48
Eight Mile Basin (All Alternatives)	4	6	65	9	12	86	6	<1	12	18

[1] Note in parentheses indicates which alternatives in Region I would be necessary to utilize the ground electrode system site.

2.5.1.2 Region II: Northwest Colorado to IPP near Delta, Utah

Region II alternative reference lines are depicted in **Figure 2-22**. Alternative II-F is the agency preferred alternative in Region II. The length of alternative routes and associated access roads in Region II are summarized in **Table 2-9** and disturbance associated with construction and operation of each is summarized in **Table 2-10**. If Design Option 3 were implemented, the transmission lines in this region would be constructed with an AC configuration (three conductors and structures to support them) for AC operation during phase one Project implementation (see **Figure 2-3**).

Table 2-9 Length of Alternative Routes and Associated Access Roads in Region II

Facilities	Length (miles)					
	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
600-kV T-Line	257	345	364	262	266	267
Access Roads	463	580	556	474	471	526

Table 2-10 Transmission Line Alternative Route Areas of Disturbance in Region II

Facilities	Construction Disturbance (acres)						Operation Disturbance (acres)					
	Alt. II-A	Alt. II-B	Alt. II-C	Alt. II-D	Alt. II-E	Alt. II-F	Alt. II-A	Alt. II-B	Alt. II-C	Alt. II-D	Alt. II-E	Alt. II-F
Access Roads	1,154	1,404	1,274	1,198	1,170	1,366	1,154	1,404	1,274	1,198	1,170	1,366
Structures & Communication Sites	1,189	1,596	1,686	1,207	1,232	1,236	24	32	34	25	25	26
Stringing & Tensioning Sites	783	1,174	1,230	1,022	894	1,033	0	0	0	0	0	0
Work Areas[1]	617	828	874	628	639	641	0	0	0	0	0	0
Facilities Total	**3,743**	**5,002**	**5,064**	**4,055**	**3,935**	**4,276**	**1,178**	**1,436**	**1,308**	**1,223**	**1,195**	**1,392**
Additional ROW – vegetation clearing[2]	5,392	7,103	7,487	5,267	5,499	5,393	0	0	0	0	0	0

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Alternative II-A (Applicant Proposed)

The TransWest proposed reference line would continue into Utah in a westerly direction, then deviate south from Highway 40 toward Roosevelt, Utah. From Roosevelt, it would pass north of Duchesne, again paralleling Highway 40 for several miles, then turn southwest toward Nephi, near U.S. Highways 6 and 89. The reference line would pass through Salt Creek Canyon then north around Nephi. It would continue west and then turn southwest following a path north of and adjacent to IPP. Portions of this corridor have been identified as preferred in a joint resolution by representatives of Juab and Millard counties.

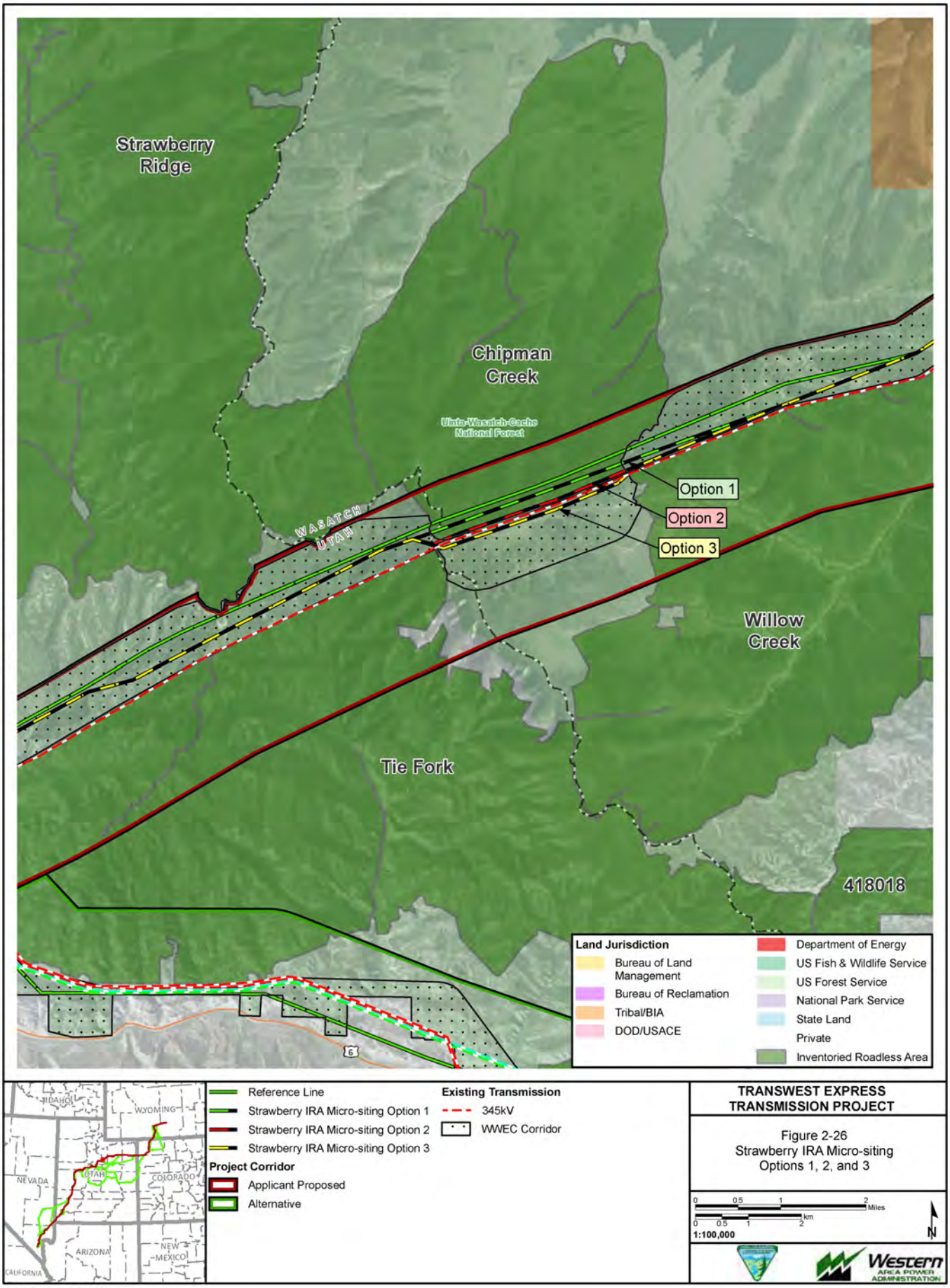
Strawberry IRA Micro-siting Options 1, 2, and 3

The Strawberry IRA micro-siting options have been developed to address concerns with construction in Uinta National Forest IRAs at a location the designated WWEC offsets from a continual corridor (**Figure 2-26**). Strawberry IRA Micro-siting Option 1 would be sited closer to the existing transmission line than Alternative II-A and still well within the IRA. Strawberry IRA Micro-siting Option 2 would be located with a 250-foot offset from the existing transmission line and within but on the edge of the IRA. Strawberry IRA Micro-siting Option 3 would cross the existing transmission line twice, remaining in the designated WWEC and avoiding the USFS IRA. These micro-siting options are compared with the portion of Alternative II-A they might replace.

The Cedar Knoll IRA micro-siting options could be utilized under Alternative II-A as well. See Alternative II-F for a description of these options.

Alternative II-B

Alternative II-B was developed to address impacts to private lands and to generally follow established utility corridors. These corridors are designated for underground utilities only and use of the corridor for the transmission line would require a plan amendment. The route would travel southwest in Colorado from the beginning of Region II, cross the Yampa River, and pass east of Rangely, Colorado. It would continue southwest where it would cross the Colorado-Utah state line and turn generally south, crossing back into Colorado in the Baxter Pass area. At that location, it would intersect the Interstate 70 (I-70) corridor, turning in a southwesterly and westerly direction, paralleling I-70. After passing south of Green River, Utah, Alternative II-B would diverge from I-70 and turn to the north along U.S. Highway 191. This highway generally would be followed until just south of the Emery-Carbon county line, where Alternative II-B would turn west and



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pass near the county line for approximately 25 miles. It generally would turn south, passing west of Huntington, Utah, before turning northwest passing northeast of Mount Pleasant, Utah. From there, it would pass through Salt Creek Canyon to Nephi, and then south around Nephi. It then would turn southwest and west adjacent to IPP, following a path south of Alternative II-A.

Alternative II-C

Alternative II-C also would decrease impacts to private lands and generally would follow established utility corridors as well as avoid USFS IRAs. Alternative II-C would follow Alternative II-B through Colorado, along I-70 into Utah, and north at Highway 191. Approximately 15 miles north on Highway 191, Alternative II-C would diverge from Alternative II-B and turn in a general westerly direction toward Castle Dale. Approximately 3 miles east of Castle Dale, this alternative would turn south and roughly parallel Utah State Highway 10 at a distance of approximately 3 miles to the east. The alternative would cross Highway 10 near the Emery-Sevier county line and turn west, again generally following the I-70 corridor into the Salina, Utah, area. Alternative II-C would pass south of Salina, turn north, and parallel U.S. Highway 50 toward Scipio, Utah. The alternative would turn west and pass Scipio on the south, then turn north, passing east of Delta, Utah, continuing into IPP.

Alternative II-D

This alternative was developed to avoid USFS IRAs and to provide additional northern route options to avoid impacts to historic trails and areas designated for special resource management along the southern routes (Alternatives II-B and II-C). It would begin along the same route as Alternative II-A. However, as it would enter Utah, it would diverge briefly to follow a designated utility corridor, causing it to zigzag once across Alternative II-A. It then would diverge to the south of the designated utility corridor and turn west-southwest. Alternative II-D would cross into Carbon County northwest of Price, and then turn southwest in the Emma Park area along Highway 191. It would follow this highway west of Helper, and then turn west toward Salt Creek Canyon where it would join and follow Alternatives II-B and II-E, then join and follow Alternative II-A into IPP.

Alternative II-E

Alternative II-E also was developed to provide additional northern route options to address the previously-mentioned resource impacts from the southern routes. This alternative would follow Alternative II-D into Utah and along the designated utility corridor, zigzagging across Alternative II-A. It then would rejoin Alternative II-A to continue east through Duchesne, Utah. Approximately 10 miles east of Duchesne, Alternative II-E would turn southwest and generally parallel Highway 191, offset by 1 to 6 miles. At the Utah-Carbon county line, this alternative would turn west through the Emma Park area, then northwest along U.S. Highway 6 until it would rejoin with Alternative II-A, following its siting to Salt Creek Canyon. At this canyon, Alternative II-E would begin to follow the alignment of Alternative II-B south of Nephi, then join and follow Alternative II-A adjacent and into IPP.

Micro-siting options have been developed in specific areas of this alternative to minimize impacts to USFS IRAs. See Alternative II-F for a description of these options.

Alternative II-F (Agency Preferred)

This alternative combines portions of other alternatives in the region and contains unique segments in the Emma Park area that together would minimize impacts to USFS IRAs, Tribal and private lands, greater sage-grouse habitat, and avoid impacts to NHTs. It would begin in southwest Moffat County (Colorado) by following Alternative II-A in designated WWEC and BLM utility corridors. As it enters Utah (Uintah County), it would separate from Alternative II-A to the northwest and follow the designated utility corridors, which then turn southwest and cross Alternative II-A. It then would diverge to the south off of the designated WWEC (still following the BLM-designated corridor) and turn west-southwest, crossing the Uintah and Ouray Indian Reservation. It then would cross into Duchesne County, where it would turn west-southwest out of the BLM utility corridor and generally follow the southern county line, crossing into Carbon County northwest of Price where it would turn west-northwest and follow Highway 6 to Thistle (Utah County) through a portion of designated WWEC and BLM utility corridors. It then would turn south, following Highway 89 for about 10 miles

before cutting south-southwest (Sanpete County) to Highway 132. At this highway, it would turn west into Nephi (Juab County) and follow a path south around the community, then turn southwest following a BLM-designated utility corridor that turns west into IPP north of Delta (Millard County), which is the end of the Project's Region II.

Cedar Knoll IRA Micro-sting Options 1 and 2

The Cedar Knoll IRA micro-siting options have been developed to address concerns with construction in USFS IRAs along the edges of the Manti-LaSal National Forest (**Figure 2-27**).Cedar Knoll IRA Micro-siting Option 1 would be co-located with a 250-foot offset from an existing transmission line, would avoid the Coal Hollow IRA, and would span a short corner of the Cedar Knoll IRA. Cedar Knoll IRA Micro-siting Option 2 also would be co-located with a 250-foot offset from an existing transmission line, would avoid the Coal Hollow IRA, and also would avoid the Cedar Knoll IRA by crossing the existing transmission line twice. These micro-siting options are compared with the portion of Alternative II-F they might replace, and also could be utilized with Alternatives II-A and II-E with the same results.

Region II Alternative Variation

Emma Park Alternative Variation

The Emma Park Alternative Variation would address potential impacts to the scenic and recreation issues along the Reservation Ridge Scenic Backway, while also considering BLM policy (IM 2012-043) regarding greater sage-grouse. This variation is compared to the portion of Alternative II-F it might replace in the Emma Park area north of Price, Utah (**Figure 2-22**), and the length and associated construction and operation disturbance are summarized in **Table 2-11**. It would deviate from Alternative II-F (and follow Alternative II-D) just north of the Duchesne-Carbon county line, then deviate from Alternative II-D at the intersection of Alternatives II-D and II-E where the Emma Park Alternative Variation would cross Emma Park and rejoin with Alternative II-F just east of Soldier Summit, Utah.

Table 2-11 Alternative Variation and Comparison Areas of Disturbance in Region II

Facilities	Length (miles)		Construction Disturbance (acres)						Operation Disturbance (acres)		
	600-kV T-Line	Access Road	Access Roads	Structures & Comm Sites	Stringing & Tensioning Sites	Work Areas	Facilities Total	Additional ROW-veg clearing	Access Roads	Structures & Comm Sites	Facilities Total
Emma Park	35	78	218	163	179	85	645	669	218	3	221
Alternative II-F Comparable	32	82	237	149	203	77	666	577	237	3	240

Region II Alternative Connectors

The alternative connectors analyzed in Region II are described below and depicted in **Figure 2-22**. The length of the alternative connectors and associated access roads along with construction and operation disturbance areas are summarized in **Table 2-12**.

Highway 191 Alternative Connector (Alternative II-F and Emma Park Alternative Variation)

The Highway 191 Alternative Connector would connect Alternative II-F with the Emma Park Alternative Variation in a way that may consider a balance of resource concerns (i.e., biological, scenic, recreation, management areas).

Castle Dale Alternative Connector (Alternatives II-B and II-C)

The Castle Dale Alternative Connector would connect Alternative II-C near Castle Dale with Alternative II-B near Huntington. This connector also could be utilized to pass from Alternative II-B to Alternative II-C.

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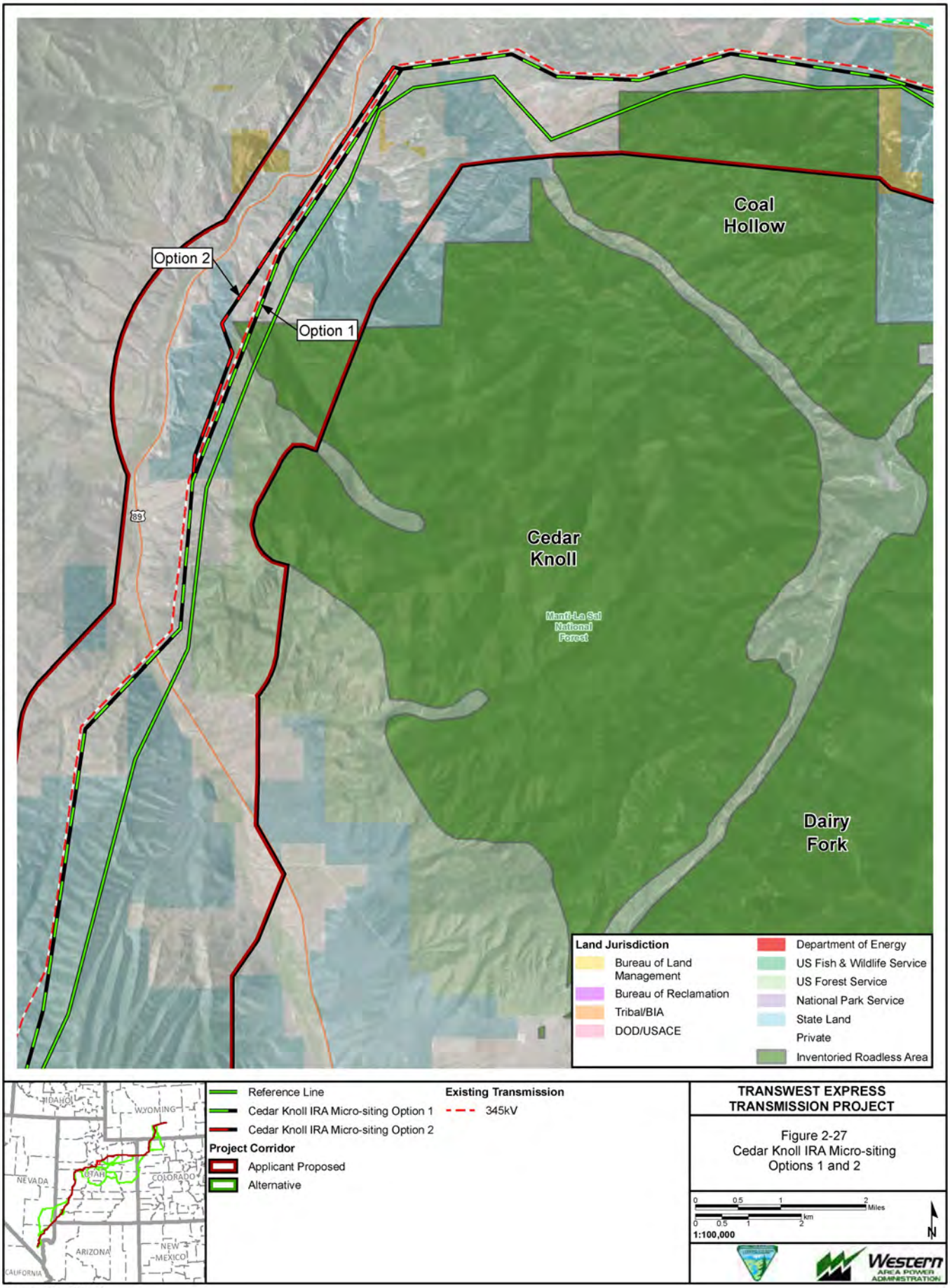

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 2-27
Cedar Knoll IRA Micro-siting
Options 1 and 2

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Table 2-12 Alternative Connectors Areas of Disturbance in Region II

Facilities	Length (miles)		Construction Disturbance (acres)						Operation Disturbance (acres)		
	600-kV T-Line	Access Road	Access Road	Structures & Comm Sites	Stringing & Tensioning	Work Areas[1]	Facilities Total	Additional ROW – Vegetation Clearing[2]	Access Road	Structures & Comm Sites	Facilities Total
Highway 191	5	13	37	22	49	11	**119**	61	37	1	**38**
Castle Dale	11	20	49	54	46	27	**176**	225	49	1	**50**
Price	18	31	79	85	72	44	**280**	369	79	2	**81**
Lynndyl	24	34	70	111	66	58	**305**	511	70	2	**72**
IPP East	3	3	7	12	11	6	**36**	50	7	0	**7**

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Price Alternative Connector (Alternatives II-B and II-D)

The Price Alternative Connector would connect Alternative II-B north of Huntington along the Emery-Carbon county line with Alternative II-D west of Price. This connector potentially also could be utilized to pass from Alternative II-D to Alternative II-B.

Lynndyl Alternative Connector (Alternatives II-B and II-C)

The Lynndyl Alternative Connector would deviate from Alternative II-C just south of Scipio, turning north and joining with Alternative II-B between Nephi and IPP.

IPP East Alternative Connector (Alternatives II-A and II-B)

The IPP East Alternative Connector would connect Alternative II-A to Alternative II-B, allowing either of these to cross to the other and approach IPP from either the north or the south.

2.5.1.3 Region III: IPP to North Las Vegas, Nevada

Region III alternative reference lines are depicted in **Figure 2-23**. Alternative III-B is the agency preferred alternative in Region III. The length of alternative routes and associated access roads in Region III are summarized in **Table 2-13** and disturbance associated with construction and operation of each is summarized in **Table 2-14**. If Design Option 2 were implemented, the transmission lines in this region would be constructed and operated as an AC transmission line (three conductors and structures to support them) in this region (see **Figure 2-2**).

Table 2-13 Length of Alternative Routes and Associated Access Roads in Region III

Facilities	Length (miles)		
	Alternative III-A	Alternative III-B	Alternative III-C
600-kV T-Line	275	284	308
Access Roads	423	401	433

Table 2-14 Transmission Line Alternative Route Areas of Disturbance in Region III

Facilities	Construction Disturbance (acres)			Operation Disturbance (acres)		
	III-A	III-B	III-C	III-A	III-B	III-C
Access Roads	971	850	926	971	850	926
Structures & Comm Sites	1,269	1,313	1,424	25	25	27
Stringing & Tensioning Sites	740	747	836	0	0	0
Work Areas[1]	661	683	740	0	0	0
Facilities Total	**3,641**	**3,593**	**3,926**	**996**	**875**	**953**
Additional ROW-veg clearing[2]	5,852	6,056	6,589	0	0	0

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Alternative III-A (Applicant Proposed)

The TransWest proposed reference line would leave IPP to the west and turn south toward Milford, Utah, following the WWEC. For the remainder of Utah, the reference line roughly would parallel Interstate 15 (I-15) approximately 20 miles west of the highway. The reference line would pass west of Milford, then generally trend south-southwest, passing east of Enterprise, Utah, and directly west of Central, Utah; exiting Utah just north of the southwest corner of the state. In Nevada, the line would cross I-15 west of Mesquite, Nevada, and remain on the south side of I-15 until reaching the North Las Vegas area northeast of Nellis Air Force Base.

Alternative III-A could incorporate the Mormon Mesa-Carp Elgin Road (Proposed Site), the Halfway Wash East (Alternative 1), Halfway Wash-Virgin River (Alternative 2), or Meadow Valley 2 (Alternative 3) locations for the ground electrode system.

Alternative III-B (Agency Preferred)

Alternative III-B was developed to decrease resource impacts in southwestern Utah (including potential impacts to the Mountain Meadows NHL and Site and IRAs in the Dixie National Forest). It would begin following Alternative III-A through Millard and Beaver counties. Near the Beaver-Iron county line, it would diverge toward the west. Alternative III-B would follow a west-southwest course, crossing into Lincoln County, Nevada, near Uvada, Utah, where it would turn to a general southerly direction, rejoining Alternative III-A to the northwest of Mesquite. It then would diverge to the west from Alternative III-A approximately 16 miles west of Mesquite, cross into Clark County, pass southeast of Moapa, Nevada, pass through the designated utility corridor on the Moapa Reservation, and rejoin Alternative III-A approximately 4 miles north of the end of Region III.

Alternative III-B could incorporate the Mormon Mesa-Carp Elgin Road (Proposed Site), the Halfway Wash East (Alternative 1), Halfway Wash-Virgin River (Alternative 2), or Meadow Valley 2 (Alternative 3) locations for the ground electrode system.

Alternative III-C

Alternative III-C also was developed to address the same resource impacts as Alternative III-B and to take advantage of an existing corridor with existing transmission line development, thereby potentially consolidating cumulative transmission line impacts. This alternative would follow Alternatives III-A and III-B before diverging from them shortly after traveling west out of IPP, where it would follow the existing IPP power line to the south for approximately 30 miles and then rejoin Alternative III-B to the Utah-Nevada state line. After passing into

Nevada at Uvada, Alternative III-C would turn west away from Alternative III-B, passing north of Caliente, Nevada; turning south approximately 15 miles west of Caliente. This alternative would follow that southern course, intersecting with U.S. Highway 93 and paralleling the highway for all but the last 15 miles into North Las Vegas. Alternative III-C would rejoin Alternative III-A northeast of Nellis Air Force Base at the end of Region III.

Alternative III-C could incorporate the Mormon Mesa-Carp Elgin Road (Proposed Site), the Halfway Wash East (Alternative 1), Halfway Wash-Virgin River (Alternative 2), or Meadow Valley 2 (Alternative 3) locations for the ground electrode system.

Region III Alternative Variations

The alternative variations analyzed in Region III are described below and depicted in **Figure 2-23**. The length of the alternative variations, associated access roads, and construction and operation disturbance areas along with those same statistics for the comparable portion of alternative routes are summarized in **Table 2-15**.

Table 2-15 Alternative Variation and Comparison Areas of Disturbance in Region III

	Length (miles)		Construction Disturbance (acres)						Operation Disturbance (acres)		
Facilities	600-kV T-Line	Access Road	Access Roads	Structures & Comm Sites	Stringing & Tensioning Sites	Work Areas[1]	Facilities Total	Additional ROW-veg clearing[2]	Access Roads	Structures & Comm Sites	Facilities Total
Ox Valley East	16	35	98	74	66	38	**276**	315	98	2	**100**
Alternative III-A Comparable	*15*	*34*	*94*	*67*	*57*	*34*	***252***	*285*	*94*	*1*	***95***
Ox Valley West	17	35	98	75	56	39	**268**	333	98	2	**100**
Alternative III-A Comparable	*15*	*34*	*94*	*67*	*57*	*34*	***252***	*285*	*94*	*1*	***95***
Pinto	29	46	108	136	134	71	**449**	572	108	3	**111**
Alternative III-A Comparable	*24*	*47*	*122*	*109*	*93*	*56*	***381***	*469*	*122*	*2*	***125***

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.
[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Ox Valley East Alternative Variation (Alternative III-A)

The Ox Valley East Alternative Variation was developed to address potential impacts to the Mountain Meadows NHL resulting from Alternative III-A. It would deviate from Alternative III-A toward the west near Enterprise, Utah, then run south through Ox Valley, rejoining Alternative III-A just south of Central, Utah.

Ox Valley West Alternative Variation (Alternative III-A)

The Ox Valley West Alternative Variation also was developed to address potential impacts to the Mountain Meadows NHL. It would begin and end with the Ox Valley East route, but follow a route further west near Enterprise.

Pinto Alternative Variation (Alternative III-A)

The Pinto Alternative Variation also addresses potential impacts to the Mountain Meadows NHL, as well as USFS IRAs. This variation would deviate from Alternative III-A to the east where the routes cross Utah State Highway 56 west of Cedar City. This variation generally would travel south, near the Pinto Canyon Road and rejoin Alternative III-A just north of the Ox Valley variations near Central.

Region III Alternative Connectors

The alternative connectors analyzed in Region III are described below and depicted in **Figure 2-23**. The length of the alternative connectors and associated access roads along with construction and operation disturbance areas are summarized in **Table 2-16**.

Table 2-16 Alternative Connector Area of Disturbance in Region III

Facilities	Length (miles)		Construction Disturbance (acres)						Operation Disturbance (acres)		
	600-kV T-Line	Access Road	Access Roads	Structures & Comm Sites	Stringing & Tensioning Sites	Work Areas[1]	Facilities Total	Additional ROW-veg clearing[2]	Access Roads	Structures & Comm Sites	Facilities Total
Avon	8	10	20	37	28	19	**104**	164	20	1	**21**
Moapa	13	17	33	61	43	31	**168**	264	33	1	**34**

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Avon Alternative Connector (Alternatives III-A, III-B, and III-C)

The Avon Alternative Connector would connect Alternatives III-B and III-C with Alternative III-A just south of the area where these routes diverge near Latimer. This connector also could be potentially utilized to pass from Alternative III-A to Alternatives III-B or III-C. The Avon connector was added to avoid potential impacts to greater sage-grouse

Moapa Alternative Connector (Alternatives III-A, III-B, and III-C)

The Moapa Alternative Connector would be located near Dry Lake, Nevada, and act as a connector between Alternatives III-A, III-B, and III-C.

Region III Ground Electrode System Alternative Facilities

The ground electrode system alternative locations in Region III are depicted in **Figure 2-23** and the lengths and disturbance areas are summarized in **Table 2-17**.

Table 2-17 Ground Electrode System Alternative Facility Lengths and Areas of Disturbance in Region III

Southern Ground Electrode System Site Alternatives	Length (miles)		Construction Disturbance (acres)				Operation Disturbance (acres)			
	34.5-kV AC Overhead Line	Access Road	Ground Electrode Sites	Over-head Lines	Access Roads	Total	Ground Electrode Sites	Over-head Lines	Access Roads	Total
Mormon Mesa-Carp Elgin Rd (Alternative III-A)	6	7	65	12	14	**91**	6	<1	14	**19**
Halfway Wash - Virgin River (Alternative III-A)	4	5	65	9	10	**84**	6	<1	10	**16**
Halfway Wash East (Alternative III-A)	8	10	65	18	20	**104**	6	<1	20	**26**
Mormon Mesa-Carp Elgin Rd (Alternative III-B)	8	10	65	18	20	**103**	6	<1	20	**26**
Halfway Wash - Virgin River (Alternative III-B)	6	7	65	13	14	**93**	6	<1	14	**20**
Halfway Wash East (Alternative III-B)	8	10	65	18	19	**102**	6	<1	19	**25**
Meadow Valley 2 (Alternative III-C)	22	29	65	49	60	**174**	6	<1	60	**66**
Delta (Design Option 2)	19	23	65	51	44	**160**	6	<1	44	**50**

2.5.1.4 Region IV: North Las Vegas to Marketplace Hub near Boulder City, Nevada

Region IV alternative reference lines are depicted in **Figure 2-24**. Alternative IV-A is the agency preferred alternative in Region IV. The length of alternative routes and associated access roads in Region IV are summarized in **Table 2-18**, and disturbance associated with construction and operation of each is summarized in **Table 2-19**. If Design Option 2 were implemented, the transmission line in this region would be constructed and operated as an AC transmission line (three conductors and structures to support them) (see **Figure 2-2**).

Table 2-18 Length of Alternative Routes and Associated Access Roads in Region IV

Facilities	Length (Miles)		
	IV-A	IV-B	IV-C
600kV T-Line	37	39	44
Access Roads	60	71	74

Table 2-19 Transmission Line Alternative Route Areas of Disturbance in Region IV

Facilities	Construction Disturbance (acres)			Operation Disturbance (acres)		
	IV-A	IV-B	IV-C	IV-A	IV-B	IV-C
Access Roads	144	176	177	144	176	177
Structures & Communication Sites	176	184	209	4	4	5
Stringing & Tensioning Sites	156	119	170	0	0	0
Work Areas[1]	90	94	107	0	0	0
Facilities Total	**566**	**573**	**663**	**148**	**180**	**182**
Additional ROW-veg clearing[2]	738	818	893	0	0	0

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Alternative IV-A (Applicant Proposed and Agency Preferred)

The TransWest proposed action would follow a designated WWEC, pass North Las Vegas to the east, and cross the congressionally designated Sunrise Mountain ISA. Crossing the ISA may entail congressional legislation modifying the designation (see Section 3.15, Special Designations, for details). It would run between Whitney, Nevada, and the Lake Las Vegas development skirting the edge of Henderson, Nevada. It would then turn in a general southwest direction to the Marketplace endpoint.

Alternative IV-B

Alternative IV-B was developed to provide an alternative that does not require crossing the Sunrise Mountain ISA. It would follow the proposed alternative for approximately 7 miles, diverge to the southeast as it passed directly east of Nellis Air Force Base and travel south through the Lake Mead NRA, passing between the Lake Las Vegas development and Lake Mead. Along the south edge of Lake Las Vegas, it would turn southwest, north of Boulder City, Nevada, then turn west and join with Alternative IV-A west of Henderson to the Marketplace endpoint.

Alternative IV-C

Alternative IV-C also would provide an alternative that would not cross Sunrise Mountain ISA. In addition, it would decrease impacts to populated areas. This alternative would follow Alternative IV-B through the Lake Mead NRA and between the Lake Las Vegas development and Lake Mead to north of Boulder City. It would then continue south before it turned southwest around the southeast edge of Boulder City, and into the Marketplace endpoint.

Region IV Alternative Variation

Marketplace Variation (Alternative IV-B)

The alternative variation analyzed in Region IV is described below and depicted in **Figure 2-24**. The length of the alternative variation, associated access roads, and construction and operation disturbance areas along with those same statistics for a comparable portion of an alternative route are summarized in **Table 2-20**.

Table 2-20 Alternative Variation and Comparison Areas of Disturbance in Region IV

Facilities	Length (miles)		Construction Disturbance (acres)						Operation Disturbance (acres)		
	600-kV T-Line	Access Road	Access Roads	Structures & Comm Sites	Stringing & Tensioning Sites	Work Areas[1]	Facilities Total	Additional ROW-veg clearing[2]	Access Roads	Structures & Comm Sites	Facilities Total
Marketplace	8	10	20	37	33	19	**109**	155	20	1	**21**
Alternative IV-B Comparable	*7*	*9*	*18*	*33*	*14*	*17*	***82***	*154*	*18*	*1*	***19***

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

The Marketplace Alternative Variation would decrease impacts to private lands. It would diverge from Alternative IV-B toward the west near Boulder City, Nevada, and reconnect with the Alternatives IV-A and IV-B near the proposed Southern Terminal.

Region IV Alternative Connectors

The alternative connectors analyzed in Region IV are described below and depicted in **Figure 2-24**. The length of the alternative connectors and associated access roads along with construction and operation disturbance areas are summarized in **Table 2-21**.

Table 2-21 Alternative Connectors Areas of Disturbance in Region IV

Facilities	Length (miles)		Construction Disturbance (acres)						Operation Disturbance (acres)		
	600-kV T-Line	Access Road	Access Roads	Structures & Comm Sites	Stringing & Tensioning Sites	Work Areas[1]	Facilities Total	Additional ROW-veg clearing[2]	Access Roads	Structures & Comm Sites	Facilities Total
Sunrise Mountain	3	4	8	13	11	6	**38**	50	8	<1	**8**
Lake Las Vegas	4	7	19	18	8	9	**54**	86	19	<1	**19**
Three Kids Mine	5	12	33	25	22	13	**93**	106	33	1	**34**
River Mountain	7	19	56	32	37	17	**142**	132	56	1	**57**
Railroad Pass	3	6	14	14	23	7	**58**	48	14	<1	**14**

[1] Work areas include staging areas, concrete batch plants, storage yards, and helicopter fly yards.

[2] Additional ROW-vegetation clearing is the remainder of the area within the ROW that is not included in construction or operation facilities disturbance that may experience some degree of vegetation clearing (e.g., mowing, woody vegetation clearing, overland travel) during construction.

Sunrise Mountain Alternative Connector (Alternatives IV-A, IV-B, and IV-C)

The Sunrise Mountain Alternative Connector would pass between Alternative IV-B (and IV-C) and Alternative IV-A on the northern border of the Lake Mead NRA.

Lake Las Vegas Alternative Connector (Alternatives IV-A, IV-B, and IV-C)

The Lake Las Vegas Alternative Connector would connect Alternative IV-B (and IV-C) and Alternative IV-A just south of each alternative's crossing of Las Vegas Wash, and would be located south of Lake Las Vegas along Lake Mead Boulevard.

Three Kids Mine Alternative Connector (Alternatives IV-A, IV-B, and IV-C)

The Three Kids Mine Alternative Connector would connect Alternative IV-B (and IV-C) and Alternative IV-A just south of the Lake Las Vegas Alternative Connector, and would be located south of the Three Kids Mine.

River Mountains Alternative Connector (Alternatives IV-A, IV-B, and IV-C)

The River Mountains Alternative Connector variation would connect Alternative IV-B (and IV-C) and Alternative IV-A from the point where Alternatives IV-B and IV-C would deviate north of Boulder City, to the point where Alternative IV-A would turn southwest toward the Marketplace endpoint.

Railroad Pass Alternative Connector (Alternatives IV-A and IV-B)

The Railroad Pass Alternative Connector would connect Alternative IV-A with Alternative IV-B from the point where Alternative IV-A would turn southwest on the west side of Boulder City to a point directly south on Alternative IV-B.

2.6 No Action Alternative

Under the No Action Alternative, the BLM or USFS would not issue ROW grants or special use permits and the Project would not be constructed.

Under the No Action Alternative, Western would not provide funding to the Project.

2.7 Alternatives Considered but Eliminated From Detailed Analysis

Figure 2-5 depicts the corridors considered during the scoping period, those that were added as a result of scoping comments, and those that have been eliminated from further consideration in the EIS. The alternative corridor segments listed in **Table 2-22** were considered through the public scoping period, but have subsequently been eliminated from detailed analysis in this EIS by the lead agencies for the reasons noted. Evaluations of segments that were eliminated from further analysis and more detailed rationales for their removal are provided in **Appendix B**.

Table 2-22 Alternatives Considered but Eliminated From Detailed Analysis

Rationale for Elimination From Detailed Analysis
Western Wyoming: Rock Springs (Region I)
Provides no benefits beyond those provided by the existing range of alternatives; equal or greater impacts to alternatives being retained for detailed analysis: • Land Use: Crossing of ROW exclusion area (Red Creek ACEC). Not compliant with Wyoming Governor's EO 2011-5. • Visual Resources: Visibility from Dinosaur National Monument and Flaming Gorge National Scenic Byway. Crossed Green River in segment eligible for Wild-and-Scenic status.

Table 2-22 Alternatives Considered but Eliminated From Detailed Analysis

Rationale for Elimination From Detailed Analysis
Wyoming-Colorado: Craig, Meeker, Rifle, Parachute, Grand Junction, and connector to the west (Region I)
Provides no benefits beyond those provided by the existing range of alternatives; equal or greater impacts to alternatives being retained for detailed analysis: • Land commitment: Greater length, use of private lands. • Visual Resources: Overall visibility to the public in the Grand Valley. • Siting: Located near other transmission lines for entire length, requiring construction across steep side slope terrain in narrow valleys.
Emery County, Utah: multiple corridors near the San Rafael Swell (Region II)
Provides no benefits beyond those provided by the existing range of alternatives; equal or greater impacts to alternatives being retained for detailed analysis: • Cultural Resources: Old Spanish NHT impacts. • Visual Resources: Scenic quality and setting changes to historic sites.
Emery, Sanpete, and Juab counties Utah: two USFWS proposed re-routes (Region II)
Provides no benefits beyond those provided by the existing range of alternatives; equal or greater impacts to alternatives being retained for detailed analysis (**Figure 2-20**): • Land Use: Eastern reroute bisects IRAs for approximately 15 miles and western reroute deviates from designated utility corridor and crosses private lands, including center-pivot irrigated agricultural lands. • Visual Resources: Eastern reroute passes through relatively undisturbed areas noted for scenic quality. • Biological Resources: Stated intent was to avoid mapped greater sage-grouse habitat; however existing alternatives to the south avoid said habitat.
Far west corridor between Delta, Utah, and U.S. Highway 93 crossing, Nevada (Region III)
Provides no benefits beyond those provided by the existing range of alternatives; equal or greater impacts to alternatives being retained for detailed analysis: • Land commitment: Greater length relative to other corridors near I-15. • Visual Resources: Large section in western Utah where no other transmission lines or other utilities currently exist. • Visual Resources: Visibility from the Great Basin National Park.
West side of Las Vegas (Region IV)
Provides no benefits beyond those provided by the existing range of alternatives; equal or greater impacts to alternatives being retained for detailed analysis: • Land Use: No available buffer to avoid both residential lands and Red Rocks National Conservation Area (NCA).

During scoping, numerous questions were raised regarding the ability to route all or portions of the transmission line underground. Underground cable systems have been considered and evaluated for the Project. To date, underground cable technology is not commercially available at the very high voltage and capacity levels (i.e., 600-kV and 3,000-MW) required to meet the proponent's objectives. The technology is not presently available, nor is it reasonably foreseeable that it would become available within the time frame for the construction of the Project. While there are theoretical and laboratory experiments in place that could conceivably be applied to the voltage and capacity levels of the proposed Project, there are no AC or DC underground installations worldwide above 500 kV or 2,000 MW either in-service or planned to be in-service in the next decade (TWE 2011). Therefore, undergrounding all or portions of the Project was not considered a viable alternative and has been eliminated from further analysis (**Appendix D**).

2.8 Comparison of Alternatives

2.8.1 Agency Preferred Alternative

The alternative preferred by the BLM within each project region was identified with input from USFS and other cooperating agencies using criteria linked to CEQ criteria for determining significant impacts. These criteria were broadened and refined based on input from the Project's cooperating agencies regarding other key resource concerns as follows:

1. Maximizes the use of appropriate (e.g., non-underground-only) existing designated utility corridors by locating within or paralleling areas of existing utility ROWs.
2. Minimizes the need for plan amendments through conformance to land use plans.
3. Avoids or minimizes resource impacts that are regulated by law (ESA, CWA, Clean Air Act [CAA], NHPA, Wilderness, WSAs, ISAs, IRAs, etc.), after consideration of project design features and agency BMPs. This includes impacts to greater sage-grouse.
4. Avoids or minimizes proximity to private residences and residential areas, thereby addressing concerns with public health and safety, aesthetics, visual effects, and others.
5. Avoids or minimizes resource impacts that demonstrate potentially unavoidable adverse impacts (residual impacts) after consideration of project design features and agency BMPs, even though they may not be specifically regulated by law.
6. Minimizes use of private lands, assuming natural resource impacts are more or less similar.
7. If multiple alternatives meet the preceding criteria, the agency preferred alternative would be the alternative that minimizes construction, operation, and maintenance expense and/or time.

Although these criteria have guided the agency preferred alternative selection process, trade-offs between items on the list occur. Parameters were established to define priorities to determine which alternatives best fulfill the criteria. These parameters are listed below and reflected in the summary tables that follow with the corresponding number/letter.

1. Existing designated utility corridors
    a. Distance within designated utility corridor (by BLM, USFS, and total)
2. Land use plan conformance
    a. Location and reason for plan amendment (by BLM, USFS, and total)
3. Resource impacts regulated by law
    a. Greater sage-grouse: amount of core habitat crossed and active leks within 4 miles
    b. Special status raptors: number of nests within 1 mile
    c. Canada Lynx: amount of habitat crossed
    d. USFWS critical desert tortoise: amount of habitat crossed
    e. Utah prairie dog: amount of habitat crossed
4. Public health and safety concerns
    a. Number of residences within 500 feet
    b. Adjacent communities within project corridor

5. Resource impacts not regulated by law
    a. Wildlife: amount of habitat crossed (by BLM, USFS, and total)
    b. Number of raptor nests within 1 mile
    c. Listing of areas of visual and recreation importance: adjacent areas of higher viewer sensitivity and large undeveloped landscapes crossed
    d. Historic Trails: count crossed and amount within 2 miles of trails
    e. LWCs and IRAs: amount crossed and context of crossing
    f. Greenfield construction: amount crossed
6. Minimal use of private lands
    a. Jurisdiction: amount crossed (by BLM, USFS, private)
7. Expense
    a. Total miles: more miles equate to more expense
    b. Miles of helicopter only construction areas crossed (based on ground constraints)

2.8.2 Summary of Impacts by Region and Alternative

A summary of impacts to the Project's action alternatives as described in Chapter 3.0 is provided by Project region in **Tables 2-23** through **2-26**. The alternative segments comprising the agency preferred alternative are highlighted in gray to facilitate comparison with the other action alternative segments. **Table 2-27** compares the applicant proposed route with the agency preferred route on a Project-wide basis (sum of impact parameters across the four Project regions).

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Region I					
Climate and Air					
	Fugitive Dust Emissions (particulate matter[PM] with an aerodynamic diameter of 10 microns or less [PM_{10}])	119.2 tons	121.2 tons	143.1 tons	130.6 tons
Geology					
	Geologic Hazards Risk	No faults, low landslide, low subsidence.	Same as Alternative I-A	Same as Alternative I-A except for historic coal mining areas posing increased risk of subsidence.	Same as Alternative I-A
	Mineral Resource Access	7 oil and gas fields crossed.	12 oil and gas fields crossed.	8 oil and gas fields crossed. No potential coal lease tracts are crossed.	7 oil and gas fields crossed.
	Paleontological Resources Loss	92 miles Potential Fossil Yield Classification (PFYC) Class 5.	111 miles PFYC Class 5.	74 miles PFYC Class 5.	123 miles PFYC Class 5.
Soils					
	Soils – Wind Erodible	231 acres	239 acres	270 acres	238 acres
	Soils – Water Erodible	259 acres	271 acres	301 acres	269 acres
	Soils – Compaction Prone	579 acres	525 acres	947 acres	706 acres
	Soils – limited revegetation potential (LRP)	741 acres	786 acres	558 acres	913 acres
	Soils – Prime Farmland	129 acres	136 acres	293 acres	136 acres
Water					
	Erosion and Sedimentation Direct Effects from Crossings	Two perennial stream crossings	Two perennial stream crossings	19 perennial stream crossings	Four perennial stream crossings
	Impaired Stream Effects from Crossings	Two impaired streams crossed	Two impaired stream crossed	Three impaired stream crossed (seven crossings)	Two impaired stream crossed
	Effects to Water Users from Construction Water Use	116 acre-feet required	119 acre-feet required	139 acre-feet required	128 acre-feet required
	Maximum Road Density Change in Watershed (Hydrographic Unit Code [HUC]10, 300-foot or 100-foot perennial buffer area)	0.10 mile/mile^2 (multiple watersheds)	0.10 mile/mile^2 (Wolf Creek Watershed)	0.40 mile/mile^2 (300 foot: Fourmile Creek Watershed)	0.10 mile/mile^2 (multiple watersheds)

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Vegetation					
	Vegetation clearing of woody vegetation over 6 feet in height	1 acre of conifer forest, 43 acres of pinyon-juniper, 28 acres of woody riparian and wetlands	1 acres of conifer forest, 45 acres of pinyon-juniper, and 29 acres of woody riparian and wetlands	1 acre of conifer forest, 46 acres of pinyon-juniper, and 23 acres of woody riparian and wetlands	1 acre of conifer forest, 45 acres of pinyon-juniper, and 24 acres of woody riparian and wetlands
Vegetation (Continued)	Wetlands and Riparian Areas impacted by Facilities Construction (acres)	21 acres of greasewood flat, 23 acres of herbaceous wetlands, 16 acres of woody riparian and wetlands	78 acres of greasewood flat, 15 acres of herbaceous wetlands and 17 acres of woody riparian and wetlands	31 acres of greasewood flat, 7 acres of herbaceous wetlands and 19 acres of woody riparian and wetlands	41 acres of greasewood flat, 29 acres of herbaceous wetlands and 15 acres of woody riparian and wetlands
	Wetlands and Riparian Areas impacted by Operations (acres)	6 acres of greasewood flat, 5 acres of herbaceous wetlands, 4 acres of woody riparian and wetlands	17 acres of greasewood flat, 3 acres of herbaceous wetlands and 4 acres of woody riparian and wetlands	8 acres of greasewood flat, 2 acres of herbaceous wetlands, and 5 acres of woody riparian and wetlands	9 acres of greasewood flat, 6 acres of herbaceous wetlands and 3 acres of woody riparian and wetlands
	USFS Management Indicator Species (MIS) Species	Alternative does not cross USFS lands	Alternative does not cross USFS lands	Alternative does not cross USFS lands	Alternative does not cross USFS lands
Special Status Plants					
	Number of USFWS species with known occurrences impacted	0	0	0	0
	Number of USFWS species with potential habitat impacted	1	1	1	1
	Number of BLM sensitive species with known occurrences impacted	3	3	3	3
	Number of BLM sensitive species with potential habitat impacted	22	22	20	22
Wildlife					
(5.a)	Pronghorn crucial winter range (acres) construction/operation	292/80	285/72	767/172	440/102
	Mule deer crucial winter range (acres) construction/operation	319/88	280/69	1,162/280	450/99
	Elk crucial winter range (acres) construction/operation	309/83	401/101	1,342/347	401/101

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Wildlife (Continued)	Small game, nongame habitat (acres) construction/operation	5,159/512	5,252/482	6,188/599	5,644/516
	Waterfowl habitat (acres) construction/operation	110/9	90/8	59/7	120/10
(5.b)	Number of raptor nests within 1 mile of the reference line	60	96	149	94
	Number of Important Bird Areas (IBAs) crossed by the 2-mile transmission line corridor	9,708	Powder Rim (9,456 acres)	Muddy Creek Wetlands (2,023 acres)	Powder Rim (11,988 acres) Muddy Creek Wetlands (3,131 acres)
Special Status Wildlife					
	Impacted potential black-footed ferret habitat (acres) construction/operation	150/42	232/55	79/22	180/46
(3.a)	Impacted greater sage-grouse habitat (acres) construction/operation	1,034/280	991/251	1,611/415	991/251
(3.a)	Total number of occupied leks within 4 miles of reference line	41	40	59	47
	Impacted western yellow-billed cuckoo potential habitat (acres) construction/operation	43/4	46/4	41/5	39/3
(3.b)	Number of special status raptor nests within 1 mile of reference line	187	225	330	208
Aquatic Biological Resources					
	Effects on aquatic habitat and species from potential direct and indirect disturbance or water quality changes	2 perennial streams crossed by the 250-foot-wide transmission line ROW; 2 game fish streams crossed by the 250-foot-wide transmission line ROW	2 perennial streams crossed by 250-foot-wide transmission line ROW; 2 game fish streams crossed by the 250-foot-wide transmission line ROW	18 perennial streams crossed by 250-foot-wide transmission line ROW; 6 game fish streams crossed by the 250-foot-wide transmission line ROW	2 perennial streams crossed by 250-foot-wide transmission line ROW; 2 game fish streams crossed by the 250-foot-wide transmission line ROW
	Potential aquatic habitat alteration or loss (feet^2)	0	0	3,600	0
	Potential amphibian mortalities from vehicle traffic	155 ROW miles	159 ROW miles	186 ROW miles	171 ROW miles

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Special Status Aquatic Resources					
	Effects on habitat and special status species from potential direct disturbance or water quality changes	2 perennial streams with special status aquatic species crossed by 250-foot ROW	2 perennial streams with special status aquatic species crossed by 250-foot ROW	7 perennial streams with special status aquatic species crossed by 250-foot ROW	2 perennial streams with special status aquatic species crossed by 250-foot ROW
		2 streams with federally listed or petitioned aquatic species	2 streams with federally listed or petitioned aquatic species	1 stream with federally listed or petitioned aquatic species	2 streams with federally listed or petitioned aquatic species
	Number of special status aquatic species with potential habitat alteration or loss	0	0	5	0
	Number of watersheds supporting special status aquatic species with increased road densities	2	2	7	2
	Potential direct disturbance on critical habitat for federally listed species	1 acre	1 acre	3 acres	1 acre
Cultural Resources					
	NRHP-listed Sites	0	0	0	0
	NRHP-eligible Sites	19	19	24	19
	Unevaluated Sites	9	8	14	11
	Potential traditional cultural properties (TCPs)	0	1	0	1
	Trail Crossings	Cherokee Trail (1) (contributing)	Cherokee Trail (1) (contributing)	Cherokee Trail (1) (contributing)	Cherokee Trail (3) (non-contributing)
		Overland Trail (1) (contributing)	Overland Trail (1) (contributing)	Overland Trail (1) (contributing)	Overland Trail (1) (contributing)
		Rawlins to Baggs Road (1) (unknown if contributing)	Rawlins to Baggs Road (1) (unknown if contributing)	Rawlins to Baggs Road (3) (1 contributing, 2 unknown)	Rawlins to Baggs Road (1) (unknown if contributing)
	Average Inventory Coverage	14%	9%	9%	35%
	Site Density (sites per 100 acres inventoried)	3	5	4	4.7
	Overall Trail/Road Visibility (within 5-mile viewshed)	92 miles (including the Lincoln Highway)	83 miles (including the Lincoln Highway)	99 miles (including the Lincoln Highway)	101 miles (including the Lincoln Highway)

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Visual Resources					
	High Sensitivity Viewers (miles)				
	0–0.5 miles	13	13	73	20
	0.5–2.5 miles	73	64	87	105
	2.5–5 miles	48	57	24	41
	>5 miles	20	25	1	6
	Moderate Sensitivity Viewers (miles)				
	0–0.5 miles	10	15	67	13
	0.5–2.5 miles	53	54	96	68
	2.5–5 miles	44	51	23	62
	>5 miles	47	39	--	29
	Scenic Quality (miles)				
	A	<1	1	<1	1
	B	61	60	94	76
	C	93	98	91	95
	BLM Visual Resource Inventory (VRI) Classifications (miles)				
	Class II	28	40	28	32
	Class III	41	22	60	39
	Class IV	85	97	97	101
	BLM Visual Resource Management (VRM) Classifications (miles)				
	Class II	--	--	--	--
	Class III	72	88	38	85
	Class IV	43	25	45	44
	USFS Scenic Integrity Objective (SIO)/Visual Quality Objective (VQO) Classifications (miles)				
	High Retention	--	--	--	--
	Moderate Partial Retention	--	--	--	--
	Low Modification	--	--	--	--

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Visual Resources	Residual Impacts Landscape Scenery (miles)				
(Continued)	High	58	57	52	59
(5.c)	Moderate	53	51	59	62
	Low	44	51	75	51
	Residual Impacts High Sensitivity Viewers (miles)				
	High	7	7	28	10
(5.c)	Moderate	96	93	117	120
	Low	51	60	41	42
	Residual Impacts Moderate Sensitivity Viewers (miles)				
	High	8	12	31	11
	Moderate	38	38	81	38
	Low	109	109	74	122
	BLM VRM USFS SIO/VQO Compliance/Consistency (miles) Before Mitigation				
	Compliant	110	105	82	115
	Non-compliant	5	8	<1	14
	NA	40	46	104	43
	BLM VRM USFS SIO/VQO Compliance/Consistency (miles) After Mitigation				
	Compliant	110	105	82	115
	Non-compliant	5	8	<1	14
	NA	40	46	104	43
Recreation					
	Recreation Area/Site in Region I	250-foot ROW Acres (% of total area)	250-foot ROW Acres (% of total area)	250-foot ROW Acres (% of total area)	250-foot ROW Acres (% of total area)
		2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)
	Rawlins FO				
	BLM dispersed undesignated	1,764 (0.05%)	1,847 (0.08%)	1,350 (0.04%)	2,297 (0.06%)
	recreation areas	78,251 (2.2%)	76,336 (2.2%)	58,224 (1.7%)	94,929 (2.7%)

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Recreation (Continued)	Continental Divide National Scenic Trail (CDNST) Special Recreation Management Area (SRMA)	1 mile/5 acres (0.8%)	1 mile/5 acres (0.8%)	1 mile/5 acres (0.8%)	1 mile/5 acres (0.8%)
		191 (31.8%)	191 (31.8%)	191 (31.8%)	191 (31.8%)
	Adobe Town Dispersed Recreation Use Area (DRUA)	N/A	101 (0.4%)	N/A	N/A
			4,420 (1.8%)		
	Little Snake FO				
	BLM dispersed undesignated recreation areas	1,328 (0.1%)	1,217 (0.09%)	770 (0.06%)	1,217 (0.09%)
		51,779 (4.1%)	63,149 (5.0%)	28,639 (2.3%)	63,149 (5.0%)
	South Sand Wash SRMA	N/A	N/A	N/A	N/A
	Juniper Mountain SRMA	N/A	N/A	40 (2.2%)	N/A
				1,437 (80.7%)	
	Serviceberry SRMA	N/A	N/A	0	N/A
				1,462 (11.8%)	
	Little Yampa Canyon SRMA	N/A	N/A	0	N/A
				<1 (0%)	
	BLM White River FO				
	Dispersed, undesignated recreation areas	373 (0.03%)	373 (0.03%)	373 (0.03%)	373 (0.03%)
		13,799 (0.9%)	13,799 (0.9%)	13,799 (0.9%)	13,799 (0.9%)
	Other Federal Recreation Areas				
	Dinosaur National Monument	N/A	N/A	N/A	0
					16 (<0.01%)
	State Recreation Areas				
	Wyoming				
	Red Rim-Daley Wildlife Habitat Management Area (WHMA)	58 (0.2%)	58 (0.2%)	58 (0.2%)	58 (0.2%)
		2,847 (11.3%)	2,847 (11.3%)	2,847 (11.3%)	2,847 (11.3%)
	Upper Muddy Creek Watershed/Grizzly WHMA	N/A	N/A	19 (0.3%)	N/A
				1,015 (1.7%)	

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Recreation (Continued)	Colorado				
	Yampa River State Wildlife Area (SWA)	N/A	N/A	0	N/A
				199 (23.1%)	
	Bitter Brush SWA	N/A	N/A	107 (1.3%)	N/A
				4,921 (61.1%)	
	Raftopolous Hunting Lease	0	N/A	N/A	N/A
		617 (5.4%)			
	Yampa River State Park	1 river crossing; 1 access point	1 river crossing; 0 access points	3 river crossings; 4 access points	1 river crossing 0 access points
	Local Recreation Areas				
	Juniper Hot Springs	N/A	N/A	0	N/A
				Entire Site	
Land Use and Planning					
(6.a)	Federal and State lands and	155 miles total: 74% located on BLM lands; 1% on state lands.	159 miles total: 71% locate don BLM lands; 3% on state lands.	186 miles total: 44 % located on BLM -managed lands; 9% on state lands	171 miles total: 74% located on BLM -managed lands; 3% on state lands.
(1.a)	Use of Designated Utility Corridors	7 miles in BLM RMP utility corridors and 4 miles in WWEC.	18 miles in BLM RMP utility corridors and 37 miles in WWEC.	60 miles in BLM RMP utility corridors and 38 miles in WWEC.	7 miles in BLM RMP utility corridors and 54 miles in WWEC.
	Avoidance/Exclusion areas crossed by reference line	Designated avoidance areas are crossed by the reference line for 1 mile in the Rawlins FO around the Overland Trail and Cherokee Trail areas. No exclusion areas	Same as Alternative I-A.	Designated avoidance areas are crossed by the reference line for 1 mile in the Rawlins FO around the Overland Trail and Cherokee Trail areas and 1 mile of Juniper Mountain.	Designated avoidance areas are crossed by the reference line for 3 miles in the Rawlins FO around the Overland Trail and Cherokee Trail areas.
(6.a)	Private Lands and Zoning	38 miles (25%) located on private land.	41 miles (26%) located on private land. 47 commercial/industrial structures and three outbuildings within 500 feet of the proposed reference line.	86 miles (47%) located on private land. 9 residences and 24 commercial structures within 500 feet of the proposed reference line.	39 miles (23%) would be located on private land. 34 commercial/industrial structures within 500 feet of the proposed reference line.

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Land Use and Planning (Continued)		45 commercial/industrial structures within 500 feet of the proposed reference line.	No communities within the 2-mile transmission line corridor.	1 community within the 2-mile transmission line corridor, no identified incompatible land uses within those communities.	No communities within the 2-mile transmission line corridor.
		No communities within the 2-mile transmission line corridor.			
(5.f)	Greenfield	93 miles (60%)	91 miles (57%)	88 miles (47%)	109 miles (64%)
	Agriculture	19 acres of initial clearing, 14 acres of construction disturbance, and four acres of permanent removal of croplands.	27 acres of initial clearing, 18 acres of construction disturbance, and 5 acres of permanent removal of croplands.	357 acres of initial clearing, 255 acres of construction disturbance, and 68 acres of permanent removal of croplands.	27 acres of initial clearing, 18 acres of construction disturbance, and five acres of permanent removal of croplands.
	Livestock Grazing	Construction impacts 5,159 acres (258 animal unit months [AUMs]); Operation impacts 501 acres (25 AUMs)	Construction impacts 5,268 acres (263 AUMs); Operation impacts 477 acres (24 AUMs)	Construction impacts 4,949 acres (247 AUMs); Operation impacts 452 acres (23 AUMs)	Construction impacts 5,655 acres (263 AUMs); Operation impacts 505 acres (25 AUMs)
Special Designation Areas					
	Rawlins FO	Approximately 0.2 mile of reference line (5 acres of 250-foot-wide transmission line ROW) would be located within the CDNST SRMA. This is less than 1 percent of the SRMA. The 2-mile transmission line corridor encompasses 181 acres of the CDNST SRMA, 68 percent of the SRMA.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A
	NPS	16 acres of entrance road to Dinosaur National Monument within 2-mile corridor; presence of construction equipment, personnel, or traffic could reduce the quality of site visitation during construction.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Special Designation Areas (Continued)		1 segment of the CDNST would be crossed. 4 acres within the 250-foot ROW and 179 acres with the 2-mile corridor. Impacts to the trail itself would be minimized by the placement of the transmission line ROW within a designated overhead utility corridor; towers would be placed to avoid surface disturbance near the actual trail.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A
(5.d)	NHTs	1 contributing segment of the Overland Trail Crossed. Visible along 9 miles of trail, 5 of which are contributing.	1 contributing segment of the Overland Trail Crossed. Visible along 10 miles of trail, 4 of which are contributing.	1 contributing segment of the Overland Trail Crossed. Visible along 7 miles of trail, 6 of which are contributing.	1 contributing segment of the Overland Trail Crossed. Visible along 9 miles of trail, 4 of which are contributing.
		1 contributing segment of the Cherokee Trail Crossed. Visible along 24 miles of trail, 10 of which are contributing.	1 contributing segment of the Cherokee Trail Crossed. Visible along 9 miles of trail, 4 of which are contributing	1 contributing segment of the Cherokee Trail Crossed. Visible along 11 miles of trail, 4 of which are contributing	1 contributing segment of the Cherokee Trail Crossed. Visible along 28 miles of trail, 10 of which are contributing
Transportation					
	Total Miles of New Permanent Access Roads	227 miles	223 miles	269 miles	242 miles
	(Beneficial effect is highest for the highest number of miles)				
	Total Miles of Steep and Mountainous Terrain	66	39	67	41
	Road Crossings	4	4	5	4
	Railroad Crossings	0	0	3	0
	Center Line Passing Through Public Land (miles)	117	118	100	133

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Transportation (Continued)	Center Line Passing Through Private Land (miles)	38	41	86	39
	Number of Airports within 5 Miles	2	2	6	2
	Military Operations Areas (MOAs) within 20 Miles	0	0	0	0
	MOAs with 250-foot-wide Transmission Line ROW Overlap	0	0	0	0
Socioeconomics					
	Short-term Socioeconomic effects	Temporary increases in local employment, demand on temporary housing, and public facilities and services.	Comparable to Alternative I-A.	Comparable to Alternative I-A.	Comparable to Alternative I-A.
		Temporary increases in sales, use and lodging taxes.	Slightly higher economic effects due to increased length and cost of power line.	Up to 20% higher economic effects due to increased length and cost of power line.	Up to 15% higher economic effects due to increased length and cost of power line.
		Effects concentrated in the Rawlins area, due to development of the northern terminal, ground electrode and the transmission line. Effects associated with terminal would be of longer duration	Essentially the same as Alternative I-A	Effects more focused in Colorado (Craig area) and some impact shifting in Wyoming (from Wamsutter to Baggs and Dixon) than under Alternative I-A	Comparable to Alternative I-A, with some shifts in Wyoming, from Wamsutter to Baggs and Dixon.
		Effects to agriculture primarily associated with limited temporary reductions of grazing on public lands.	Comparable to Alternative I-A	Less effect on livestock grazing on public lands, higher potential effects on irrigated farming and ranching.	Comparable to Alternative I-A
	Long-term socioeconomic effects	Little long-term effects on employment, population, housing need or public services.	Essentially the same as Alternative I-A	Essentially the same as Alternative I-A, with some geographic redistribution between Colorado and Wyoming.	Essentially the same as Alternative I-A

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Socioeconomics (Continued)		Substantial ad valorem taxes paid; primarily to Carbon County and Carbon County School District #1 (WY), with lesser revenues to Sweetwater (WY), Moffat County (CO), and other taxing jurisdictions.	Essentially the same as Alternative I-A	Essentially the same as Alternative I-A	Essentially the same as Alternative I-A
		Limited effects on property values, social values, and limited conflicts with outdoor recreation. Limited private land and existing energy resource development in proximity to much of the ROW.	Comparable to Alternative I-A	Higher potential social effects due to proximity to private lands and visibility from highways.	Comparable to Alternative I-A
		Federal government and other lessors gain ROW rental/lease income.	Essentially the same as Alternative I-A	Slightly higher than Alt. I-A due to increased length of the ROW.	Slightly higher than Alt. I-A due to increased length of the ROW.
		No Environmental Justice concerns, although facilities are located near the Wyoming State Penitentiary.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A
Health and Safety					
	Serious injuries to workers and the public at-large	Workers during construction and operation may be injured by heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical hazards found on a construction site. The workers and the public may be injured by fire as well as downed power lines.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Health and Safety (Continued)	Adverse health impacts from electric and magnetic fields (EMF), stray voltage, and induced voltage associated with transmission lines.	Three outbuildings and 11 commercial/industrial structures would be within 200 feet of the reference line, resulting in potential impacts from EMF, stray voltage, and induced voltage.	Seven outbuildings and 9 commercial/industrial structures would be within 200 feet of the reference line, resulting in the potential for slightly greater impacts from EMF, stray voltage, and induced current than Alternative I-A.	Eleven outbuildings and 24 commercial/ industrial structures would be within 200 feet of the reference line, resulting in the potential for greater impacts from EMF, stray voltage, and induced current than Alternative I-A.	Three outbuildings and 39 commercial/industrial structures would be within 200 feet of the reference line, resulting in the potential for greater impacts from EMF, stray voltage, and induced current than Alternative I-A.
(4.a) (4.b)	Noise impacts to nearby communities and residences	There would be no communities within the 2-mile transmission line corridor and no residential structures within 500 or 200 feet of the reference line, resulting in negligible impacts from noise with this alternative.	There would be no communities within the 2-mile transmission line corridor and no residential structures within 500 or 200 feet of the reference line, resulting in impacts from noise that are similar to Alternative I-A.	There would be one community within the 2-mile transmission line corridor and nine residential structures within 500 feet of the reference line, resulting in impacts from noise that are greater than Alternative I-A.	There would be no communities within the 2-mile transmission line corridor and no residential structures within 500 or 200 feet of the reference line, resulting in impacts from noise that are similar to Alternative I-A.
Wild Horses					
	Temporary and permanent loss of forage areas	407 acres of 250-foot-wide transmission line ROW within the Adobe Town Herd Management Area (HMA) (0.1% of the HMA). 174 acres of temporary disturbance, 47 acres permanent. 244 acres of 250-foot-wide transmission line ROW within the Sand Wash Basin HMA (0.1% of the HMA). 110 acres of temporary disturbance, 30 acres permanent.	499 acres of 250-foot-wide transmission line ROW within the Adobe Town HMA (0.1% of the HMA). 218 acres of temporary disturbance, 48 acres permanent. No acres of 250-foot-wide transmission line ROW within the Sand Wash Basin HMA. 2 acres of temporary disturbance, 1 acre permanent.	N/A	36 acres of 250-foot-wide transmission line ROW within the Adobe Town HMA (<0.1% of the HMA). 26 acres of temporary disturbance, 5 acres permanent. No acres of 250-foot-wide transmission line ROW within the Sand Wash Basin HMA. 2 acres of temporary disturbance, 1 acre permanent.

Table 2-23 Summary of Impacts for Region I

Resource	Resource Topic	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Wild Horses (Continued)	Temporary construction noise and human activity	17,248 acres of 2-mile transmission line corridor within the Adobe Town HMA (3.6% of HMA). 8,163 acres of 2-mile transmission line corridor within the Sand Wash Basin HMA (5.2% of the HMA).	20,948 acres of 2-mile transmission line corridor within the Adobe Town HMA (4.4% of HMA). 695 acres of 2-mile transmission line corridor within the Sand Wash Basin HMA (0.4% of the HMA).	N/A	4,038 acres of 2-mile transmission line corridor within the Adobe Town HMA (0.9% of HMA). 695 acres of 2-mile transmission line corridor within the Sand Wash Basin HMA (0.4% of the HMA).
	Presence of transmission line within HMAs/herd areas (HAs) restrict helicopter use during wild horse gathers	13 miles of transmission line within the Adobe Town HMA. 8 miles of transmission line within the Sand Wash Basin HMA.	17 miles of transmission line within the Adobe Town HMA. No miles of transmission line within the Sand Wash Basin HMA.	N/A	One mile of transmission line within the Adobe Town HMA. No miles of transmission line within the Sand Wash Basin HMA.
Lands with Wilderness Characteristics (LWC)					
(5.e)	Number of LWC Units Affected	8	9	2	8
(5.e)	Number (acres) of LWC Units Eliminated	1 (5,356)	2 (11,699)	0	2 (11,699)
(5.e)	Number (acres) of LWC Units Remaining	7 (46,188)	7 (50,202)	2 (20,412)	6 (44,108)
(5.e)	Number (acres) of Unit Portions Eliminated	7 (6,693)	8 (8,211)	2 (3,676)	7 (8,200)
Plan Amendments					
(2.a)	Location, length, and reason for plan amendment	RFO (58 miles)—expand existing and designate new utility corridor LSFO (42 miles)—new utility corridor	RFO (61 miles)—expand existing and convert/expand underground-only ROW LSFO (37 miles)—new utility corridor	RFO (27 miles)—expand existing utility corridors	RFO (76 miles)—expand existing and designate new utility corridor LSFO (37 miles)—new utility corridor

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Region II							
Climate and Air Quality							
	Fugitive Dust Emissions (PM_{10})	205.6 tons	272.4 tons	282.4 tons	210.2 tons	212.9 tons	211.0 tons
Geology							
	Geologic Hazards Risk	Three active faults crossed. Moderate risk for ground motion. Moderate to high risk for landslide impacts. Low to moderate risk for ground subsidence.	Four active faults crossed. Same as Alternative II-A, except increased risk for subsidence due to active and historic underground coal mining.	Five active faults crossed. Same as Alternative II-A.	Two active faults crossed. Moderate risk for ground motion. Moderate to high risk for landslide impacts. Increased risk for subsidence due to historic coal mining.	Two active faults crossed. Moderate risk for ground motion. Moderate to high risk for landslide impacts.	Same as Alternative II-D.
		6 oil and gas fields crossed. Encroaches on propose coal mine permit area, Deserado Mine.	15 oil and gas fields crossed. Approximately 15.0 miles of active coal mine permit areas.	15 oil and gas fields crossed. Approximately 3.0 miles of active coal mine permit areas.	5 oil and gas fields crossed. Approximately 5 miles of active coal mine permit areas.	5 oil and gas fields crossed. Encroaches on proposed coal mine permit area, Deserado Mine.	7 oil and gas fields crossed. Encroaches on proposed coal mine permit area, Deserado Mine.
	Paleontological Resources Loss	120 miles PFYC Class 5.	74 miles PFYC Class 5.	77 miles PFYC Class 5.	129 miles PFYC Class 5.	113 miles PFYC Class 5.	156 miles PFYC Class 5.
Soils							
	Soils – Wind Erodible	247 acres	152 acres	167 acres	280 acres	247 acres	210 acres
	Soils – Water Erodible	194 acres	580 acres	612 acres	252 acres	246 acres	257 acres
	Soils – Compaction Prone	1,214 acres	2,013 acres	1,929 acres	1,317 acres	1,137 acres	1,361 acres
	Soils – LRP	1,092 acres	1,921 acres	2,351 acres	1,018 acres	1,045 acres	1,247 acres
	Soils – Prime Farmland	347 acres	413 acres	484 acres	279 acres	278 acres	178 acres
Water							
	Erosion and Sedimentation Direct Effects from Crossings	19 perennial stream crossings	26 perennial stream crossings	24 perennial stream crossings	17 perennial stream crossings	40 perennial stream crossings	27 perennial stream crossings
	Impaired Stream Effects from Crossings	Four impaired streams crossed	Three impaired stream crossed (39 crossings)	Five impaired streams crossed (41 crossings)	One impaired stream crossed	Five impaired streams crossed (23 crossings)	Three impaired streams crossed (7 crossings)

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Water (Continued)	Effects to Water Users from Construction Water Use	192 acre-feet required	258 acre-feet required	272 acre-feet required	195 acre-feet required	199 acre-feet required	199 acre-feet required
	Maximum Road Density Change in Watershed (HUC10, 300-foot or 100-foot perennial buffer area)	0.5 mile/mile^2 (300 feet: Currant Creek Watershed) (0.27 mile/mile^2 (100 feet: Soldier Creek Watershed)	1.33 mile/mile^2 (100 feet: West Salt Creek Watershed)	1.33 mile/mile^2 (100 feet: West Salt Creek Watershed)	0.67 mile/mile^2 (300 feet: Coyote Wash Watershed)	3.74 mile/mile^2 (300 feet: Antelope Creek Watershed)	0.67mile/mile^2 (300 feet: Coyote Wash Watershed)
Vegetation							
	Vegetation clearing of woody vegetation over 6 feet in height	165 acres of aspen forest and woodland, 68 acres of conifer forest, 29 acres of deciduous forest, 732 acres of pinyon-juniper, and 53 acres of woody riparian and wetlands	149 acres of aspen forest and woodland, 150 acres of conifer forest, 956 acres of pinyon-juniper, and 36 acres of woody riparian and wetlands	49 acres of aspen forest and woodland, 34 acres of conifer forest, 1,026 acres of pinyon-juniper, and 30 acres of woody riparian and wetlands	270 acres of aspen forest and woodland, 124 acres of conifer forest, 727 acres of pinyon-juniper, and 15 acres of woody riparian and wetlands	65 acres of aspen forest and woodland, 82 acres of conifer forest, 4 acres of deciduous forest, 894 acres of pinyon-juniper, and 34 acres of woody riparian and wetlands	162 acres of aspen forest and woodland, 191 acres of conifer forest, 4 acres of deciduous forest, 865 acres of pinyon-juniper, and 15 acres of woody riparian and wetlands
	Wetlands and Riparian Areas impacted by Facilities Construction (acres)	152 acres of greasewood flat, 12 acres of herbaceous wetlands, and 38 acres of woody riparian and wetlands	506 acres of greasewood flat, 8 acres of herbaceous wetlands and 27 acres of woody riparian and wetlands	538 acres of greasewood flat, 6 acres of herbaceous wetlands and 26 acres of woody riparian and wetlands	215 acres of greasewood flat, 15 acres of herbaceous wetlands and 12 acres of woody riparian and wetlands	176 acres of greasewood flat, 35 acres of herbaceous wetlands, and 28 acres of woody riparian and wetlands	212 acres of greasewood flat, 16 acres of herbaceous wetlands, and 16 acres of woody riparian and wetlands
	Wetlands and Riparian Areas impacted by Operations (acres)	36 acres of greasewood flat, 3 acres of herbaceous wetlands, and 11 acres of woody riparian and wetlands	119 acres of greasewood flat, 2 acres of herbaceous wetlands and 7 acres of woody riparian and wetlands	129 acres of greasewood flat, 2 acres of herbaceous wetlands and 8 acres of woody riparian and wetlands	53 acres of greasewood flat, 4 acres of herbaceous wetlands and 4 acres of woody riparian and wetlands	41 acres of greasewood flat, 8 acres of herbaceous wetlands and 9 acres of woody riparian and wetlands	54 acres of greasewood flat, 1 acre of herbaceous wetlands, and 7 acres of woody riparian and wetlands
	USFS MIS Species	Alternative does not cross USFS Fishlake National Forest	Based on elevation, there is no potential habitat for this species within the USFS Fishlake National Forest.	Potential habitat would be possible based on substrate, elevation, and vegetation parameters. The population has historically been found to be stable and viable across the USFS Fishlake National Forest.	Alternative does not cross USFS Fishlake National Forest.	Alternative does not cross USFS Fishlake National Forest.	Based on elevation, there is no potential habitat for this species within the USFS Fishlake National Forest.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Status Plants							
	Number of USFWS species with known occurrences impacted	2	1	2	3	4	5
	Number of USFWS species with potential habitat impacted	6	8	9	6	5	8
	Number of BLM sensitive species with known occurrences impacted	6	12	17	9	11	10
	Number of BLM sensitive species with potential habitat impacted	29	36	43	32	32	34
	Number of USFS sensitive species with known occurrences impacted	0	1	2	2	2	2
	Number of USFS sensitive species with potential habitat impacted	3	7	7	7	6	9
Wildlife							
(5.a)	Pronghorn crucial winter range (acres) Construction/operation	731/219	1,274/303	1,086/264	1,275/354	768/192	1,047/284
	Mule deer crucial winter range (acres) construction/operation	1,041/362	836/275	943/254	823/265	1,072/371	803/282
	Elk crucial winter range (acres) construction/operation	1,102/408	927/283	979/273	808/279	1,565/591	937/573
	Moose occupied habitat (acres) construction/operation	222/72	311/125	0/0	790/256	432/143	710/255

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Wildlife (Continued)	Rocky Mountain or desert bighorn sheep (acres) construction/operation	RMBS 14/6	DBS 23/5	DBS 26/6	RMBS 151/45	RMBS 3/2	RMBS 147/41
	Small game, nongame habitat (acres) construction/operation	8,613/1,110	11,436/1,350	12,093/1,252	8,876/1,166	8,846/1,125	9,169/1,327
	Waterfowl habitat (acres) construction/operation	131/17	94/11	96/12	64/9	157/18	54/10
(5.b)	Number of raptor nests within 1 mile of the reference line	99	107	99	139	101	117
	Number of IBAs crossed by the 2-mile transmission line corridor	Upper Strawberry Watershed (UT12) (1,399 acres)	0	0	0	0	0
	Number of MIS species whose habitat is crossed by alternative[2]	1	9	8	2	3	10
Special Status Wildlife							
	Impacted black-footed ferret habitat (acres) construction/operation	217/53	67/15	122/27	201/51	254/63	201/51
(3.a)	Impacted greater sage-grouse habitat (acres) construction/operation	2,664/747	750/248	195/49	2,385/659	2,924/744	1,432/388
	Number of occupied leks within 4 miles of reference line	7	0	0	10	10	15
	Impacted western yellow-billed cuckoo potential habitat (acres) construction/operation	90/12	63/7	56/8	26/4	62/9	32/7

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Status Wildlife (Continued) (3.c)	Impacted Canada lynx potential habitat (acres) construction/operation	120/20	287/54	63/9	243/43	158/26	418/91
(3.e)	Impacted Utah prairie dog potential habitat (acres) construction/operation	0/0	Same as Alternative II-A	179/33	Same as Alternative II-A	Same as Alternative II-A	Same as Alternative II-A
(3.b)	Number of special status raptor nests within 1 mile of the reference line[2]	129	154	124	250	156	200
Aquatic Biological Resources							
	Effects on aquatic habitat and species from potential direct and indirect disturbance or water quality changes	26 perennial streams crossed by 250-foot-wide transmission line ROW; 14 game fish streams crossed by the 250-foot-wide ROW	27 perennial streams crossed by 250-foot-wide transmission line ROW; 11 game fish streams crossed by the 250-foot-wide transmission line ROW	29 perennial streams crossed by 250-foot-wide transmission line ROW; 13 game fish streams crossed by the 250-foot-wide transmission line ROW	26 perennial streams crossed by 250-foot-wide transmission line ROW; 17 game fish streams crossed by the 250-foot-wide transmission line ROW	39 perennial streams crossed by 250-foot-wide transmission line ROW; 13 game fish streams crossed by the 250-foot-wide transmission line ROW	30 perennial streams crossed by 250-foot-wide transmission line ROW; 12 game fish streams crossed by the 250-foot-wide transmission line ROW
	Potential aquatic habitat alteration or loss (feet^2)	10,000	19,600	22,000	7,200	17,600	7,200
	Potential amphibian mortalities from vehicle traffic	257 ROW miles	345 ROW miles	365 ROW miles	262 ROW miles	266 ROW miles	267 ROW miles
Special Status Aquatic Resources							
	Effects on habitat and special status species from potential direct disturbance or water quality changes	12 perennial streams with special status aquatic species crossed by 250-foot ROW	8 perennial streams with special status aquatic species crossed by 250-foot ROW	11 perennial streams with special status aquatic species crossed by 250-foot ROW	7 perennial streams with special status aquatic species crossed by 250-foot ROW	13 perennial streams with special status aquatic species crossed by 250-foot ROW	11 perennial streams with special status aquatic species crossed by 250-foot ROW
		1 stream with federally listed or petitioned aquatic species	2 streams with federally listed or petitioned aquatic species	2 streams with federally listed or petitioned aquatic species	2 streams with federally listed or petitioned aquatic species	1 stream with federally listed or petitioned aquatic species	2 streams with federally listed or petitioned aquatic species

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
SS Aquatic Resources (Continued)	Number of special status aquatic species with potential habitat alteration or loss	12	7	5	5	7	5
	Number of watersheds supporting special status aquatic species with increased road densities	13	9	10	8	12	11
	Potential direct disturbance on critical habitat for federally listed species[1]	4 acres	7 acres	7 acres	7 acres	4 acres	7 acres
Cultural Resources							
	NRHP-listed Sites	0	1	1	0	0	0
	NRHP-eligible Sites	13	48	45	26	17	20
	Unevaluated Sites	0	17	24	3	0	3
	Potential TCPs	1	8	10	4	1	4
	Trail Crossings	Old Spanish Trail (0)	Old Spanish Trail (4) (1 NHT II, 1 NHT III, 2 NHT V)	Old Spanish Trail (9) (1 NHT II, 1 NHT III, 3 NHT IV, 4 not categorized)	Old Spanish Trail (0)	Old Spanish Trail (0)	Old Spanish Trail (0)
	Average Inventory Coverage	20%	19%	23%	19%	18%	22.4%
	Site Density (sites per 100 acres inventoried)	0.12	0.25	0.5	0.1	0.67	0.09
	Overall Trail Visibility (within 5-mile viewshed)	0 miles	58 miles	107 miles	0 miles	0 miles	0 miles
Visual Resources							
	High Sensitivity Viewers						
	0–0.5 miles	78	94	90	50	84	74
	0.5–2.5 miles	127	196	214	116	125	128
	2.5–5 miles	35	38	48	50	35	31
	>5 miles	18	15	10	45	22	34

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Visual	Moderate Sensitivity Viewers						
Resources	0–0.5 miles	72	169	206	72	71	88
(Continued)	0.5–2.5 miles	132	145	141	104	118	103
	2.5–5 miles	44	29	15	47	50	33
	>5 miles	9	--	--	39	27	42
	Scenic Quality (miles)						
	A	<1	1	2	25	10	44
	B	139	131	124	98	135	102
	C	118	213	237	139	121	119
	BLM VRI Classifications (miles)						
	Class II	9	19	22	40	31	66
	Class III	33	49	64	62	45	23
	Class IV	111	243	242	138	113	138
	BLM VRM Classifications (miles)						
	Class II	--	5	5	2	--	2
	Class III	48	135	159	50	44	39
	Class IV	51	66	55	94	56	83
	USFS SIO/VQO Classifications (miles)						
	High Retention	<1	3	9	<1	<1	4
	Moderate Partial Retention	21	18	20	8	23	14
	Low Modification	--	--	--	--	--	--
	Residual Impacts Landscape Scenery (miles)						
	High	97	96	84	103	108	127
(5.c)	Moderate	78	133	143	98	98	68
	Low	82	115	137	61	60	70
	Residual Impacts High Sensitivity Viewers (miles)						
	High	61	42	3	46	67	71
(5.c)	Moderate	117	234	247	142	138	123
	Low	80	66	81	73	62	73

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Visual Resources (Continued)	Residual Impacts Moderate Sensitivity Viewers (miles)						
	High	55	83	111	49	49	61
	Moderate	93	182	184	101	100	105
	Low	109	78	68	111	117	101
	BLM VRM USFS SIO/VQO Compliance/Consistency (miles) Before Mitigation						
	Compliant	116	176	182	143	122	130
	Non-compliant	4	51	66	11	2	12
	NA	137	118	117	108	143	125
	BLM VRM USFS SIO/VQO Compliance/Consistency (miles) After Mitigation						
	Compliant	117	214	217	146	122	133
	Non-compliant	3	13	31	8	1	8
	NA	137	118	117	108	143	25
Recreation							
	Recreation Area/Site in Region II	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)
		2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)
	BLM White River FO						
	Dispersed, undesignated	587 (0.04%)	1,389 (<0.1%)	1,389 (<0.1%)	587 (0.04%)	587 (0.04%)	587 (0.04%)
	recreation areas	22,827 (1.6%)	57,802 (4.0%)	57,802 (4.0%)	22,908 (1.6%)	22,908 (1.6%)	22,908 (1.6%)
	BLM Grand Junction FO						
	Dispersed, undesignated	N/A	600 (0.05%)	600 (0.05%)	N/A	N/A	N/A
	recreation areas		32,592 (2.5%)	32,592 (2.5%)			
	BLM Moab FO						
	Dispersed, undesignated	N/A	1,806 (0.2%)	1,806 (0.2%)	N/A	N/A	N/A
	recreation areas		69,181 (5.8%)	69,181 (5.8%)			
	Labyrinth Canyon/Gemini	N/A	75 (0.02%)	75 (0.02%)	N/A	N/A	N/A
	Bridges SRMA		4,087 (1.4%)	4,087 (1.4%)			
	Utah Rims SRMA	N/A	0	0	N/A	N/A	N/A
			925 (6.0%)	925 (6.0%)			

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation	BLM Vernal FO						
(Continued)	Dispersed, undesignated	1,113 (0.07%)	168 (0.01%)	168 (0.01%)	2,337 (0.2%)	1,133 (0.07%)	2,494 (0.2%)
	recreation areas	38,850 (2.5%)	5,151 (0.3%)	5,151 (0.3%)	89,284 (5.7%)	42,226 (2.7%)	92,872 (6%)
	Fantasy Canyon SRMA	N/A	N/A	N/A	0	N/A	0
					54 (78.3%)		54 (78.3%)
	Nine Mile Canyon SRMA	N/A	N/A	N/A	0	N/A	0
					1,456 (3.3%)		1,453 (3.3%)
	BLM Price FO						
	Dispersed, undesignated	N/A	1,684 (0.1%)	1,709 (0.1%)	186 (0.01%)	5 (0%)	N/A
	recreation areas		68,221 (5%)	68,157 (5%)	10,385 (0.8%)	66 (0.03%)	
	Labyrinth Canyon SRMA	N/A	3 (0.02%)	3 (0.02%)	N/A	N/A	N/A
			154 (0.4%)	154 (0.4%)			
	San Rafael Swell SRMA	N/A	N/A	180 (0.02%)	N/A	N/A	N/A
				10,589 (1.1%)			
	BLM Richfield FO						
	Dispersed, undesignated recreation areas	38 (0%)	140 (0.01%)	436 (0.03%)	41 (0%)	38 (0%)	38 (0%)
		1,378 (0.1%)	5,821 (0.5%)	16,284 (1.3%)	1,574 (0.1%)	1,378 (0.1%)	1,378 (0.1%)
	BLM Salt Lake FO						
	Dispersed, undesignated recreation areas	3 (0%)	N/A	N/A	N/A	5 (0%)	108 (0%)
		323 (0.02%)				1,675 (0.05%)	2,489 (0.08%)
	BLM Fillmore FO						
	Dispersed, undesignated recreation areas	1,257 (0.03%)	504 (0.01%)	523 (0.01%)	1,261 (0.03%)	1,261 (0.03%)	524 (0.01%)
		49,166 (1.1%)	21,815 (0.5%)	18,657 (0.4%)	48,833 (1.1%)	48,833 (1.1%)	22,245 (0.5%)
	Little Sahara Recreation	183 (0.3%)	N/A	N/A	183 (0.3%)	183 (0.3%)	N/A
	Area (RA)	5,974 (10%)			5,974 (10%)	5,974 (10%)	

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation	USFS Recreation Areas						
(Continued)	Recreation Area	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)
	ROS	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)
	Ashley National Forest						
	Rural	N/A	N/A	N/A	N/A	N/A	N/A
	Roaded Modified	N/A	N/A	N/A	N/A	N/A	N/A
	Roaded Natural	N/A	N/A	N/A	10 (<0.01%)	300 (0.07%)	40 (<0.01%)
					884 (0.2%)	7,863 (1.7%)	2,118 (0.5%)
	Semi-Primitive Motorized	N/A	N/A	N/A	1 (0%)	0	1 (0%)
					2,629 (0.9%)	1,822 (0.6%)	2,629 (0.9%)
	SPM Within IRA	N/A	N/A	N/A	*0*	*0*	*1*
					2,263 (0.9%)	*1,822 (0.6%)*	*2,623 (0.9%)*
	Remainder in SPM ROS	N/A	N/A	N/A	*0*	*0*	*0*
					6 (<0.01%)	*0*	*6*
	Semi-Primitive Non-	*N/A*	*N/A*	*N/A*	0	0	0 (<0.01%)
	motorized				630 (0.2%)	5,802 (1.6%)	*649 (0.2%)*
	SPNM Within IRA	*N/A*	*N/A*	*N/A*	*0*	*0*	*0*
					630 (0.2%)	*5,784 (1.5%)*	*649 (0.2%)*
	Remainder in SPNM ROS	*N/A*	*N/A*	*N/A*	*N/A*	*0*	N/A
						18 (<0.01%)	
	Primitive	N/A	N/A	N/A	N/A	N/A	N/A
	Unknown/Private	N/A	N/A	N/A	N/A	N/A	N/A
	Total	NA	NA	NA	11	300	41
					4,143	15,487	5,396
	Uinta National Forest						
	Rural	0	N/A	N/A	N/A	N/A	N/A
		23 (1.4%)					

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation (Continued)	Roaded Modified	160 (0.2%)	N/A	N/A	0	242 (0.3%)	242 (0.3%)
		4,475 (5.3%)			31 (0.04%)	4,929 (5.8%)	4,929 (5.8%)
	Roaded Natural	286 (0.1%)	N/A	N/A	0	0	31 (0.01%)
		7,904 (2.9%)			17 (0.01%)	648 (0.2%)	1,104 (0.4%)
	Semi-Primitive Motorized	97 (<0.1%)	N/A	N/A	N/A	0	17 (<0.01%)
		11,800 (3.3%)				4,752 (1.3%)	4,988 (1.4%)
	SPM Within IRA	*0*	*N/A*	*N/A*	*N/A*	*0*	*17 (<0.01%)*
		10,102 (2.8%)				*3,581 (1%)*	*3,816 (1.1%)*
	Remainder in SPM ROS	*97 (<0.1%)*	*N/A*	*N/A*	*N/A*	*0*	*0*
		1,698 (0.5%)				*1,172 (0.3%)*	*1,172 (0.3%)*
	Semi-Primitive Non-motorized	N/A	N/A	N/A	N/A	N/A	N/A
	Primitive	<1	N/A	N/A	N/A	N/A	N/A
	Unknown/Private	2 (<0.01%)	N/A	N/A	N/A	0	0
		11 (<0.01%)				20 (<0.02%)	20 (<0.02%)
	Total	545	NA	NA	0	242	290
		24,213			48	10,349	11,021
	Manti-La Sal National Forest						
	Rural	N/A	N/A	N/A	0	N/A	N/A
					16 (2.0%)		
	Roaded Modified	N/A	N/A	N/A	N/A	N/A	N/A
	Roaded Natural	26 (0.01%)	392 (<0.1%)	N/A	173 (0.03%)	31 (0.01%)	31 (0.01%)
		685 (0.1%)	14,379 (2.9%)		7,183 (1.4%)	1,266 (0.3%)	1,266 (0.3%)
	Semi-Primitive Motorized	52 (0.01%)	144 (0.02%)	N/A	77 (0.01%)	52 (0.01%)	52 (0.01%)
		3,592 (0.5%)	7,555 (1.0%)		3,729 (0.5%)	3,592 (0.5%)	3,592 (0.5%)
	SPM Within IRA	*26 (<0.01%)*	*<1 (<0.01%)*	*N/A*	*0*	*26 (<0.01%)*	*26 (<0.01%)*
		2,156 (0.3%)	*3,121 (0.4%)*		*574 (0.1%)*	*2,156 (0.3%)*	*2,156 (0.3%)*
	Remainder in SPM ROS	*26 (<0.01%)*	*144 (0.02%)*	*N/A*	*77 (0.1%)*	*27 (<0.01%)*	*26 (<0.01%)*
		1,436 (0.2%)	*4,439 (0.6%)*		*3,153 (0.4%)*	*1,436 (0.2%)*	*1,436 (0.2%)*

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation (Continued)	Semi-Primitive Non-motorized	N/A	0	N/A	0	N/A	N/A
			10 (0.01%)		10 (0.01%)		
	SPNM Within IRA	*N/A*	*0*	*N/A*	*N/A*	*N/A*	*N/A*
			10 (0.01%)				
	Remainder in SPNM ROS	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Primitive	N/A	N/A	N/A	N/A	N/A	N/A
	Unknown/Private	N/A	N/A	N/A	<1 (0.01%)	N/A	N/A
					119 (0.2%)		
	Total	78	536	NA	250	83	83
		4,277	21,944		11,055	4,858	4,858
	Fishlake National Forest						
	Rural	N/A	N/A	N/A	N/A	N/A	N/A
	Roaded Modified	N/A	N/A	N/A	N/A	N/A	N/A
	Roaded Natural	N/A	116 (0.02%)	476 (0.1%)	N/A	N/A	116 (0.2%)
			2,595 (0.5%)	21,822 (4.2%)			2,595 (0.5%)
	Semi-Primitive Motorized	N/A	0	394 (0.04%)	N/A	N/A	0
			1,534 (0.1%)	18,887 (1.8%)			1,534 (0.1%)
	Within IRA	*N/A*	*0*	*0*	*N/A*	*N/A*	*0*
			0	*1,151 (0.1%)*			*0*
	Remainder in SPM ROS	*N/A*	*0*	*400 (0.4%)*	*N/A*	*N/A*	*0*
			1,534 (0.1%)	*17,736 (1.7%)*			*1,534 (0.1%)*
	Semi-Primitive Non-motorized	N/A	N/A	0	*N/A*	*N/A*	*N/A*
				111 (0.06%)			
	SPNM Within IRA	N/A	N/A	0	*N/A*	*N/A*	*N/A*
				89 (0.05%)			
	Remainder in SPNM ROS	N/A	N/A	22 (0.01%)	*N/A*	*N/A*	*N/A*
	Primitive	N/A	N/A	N/A	N/A	N/A	N/A
	Unknown/Private	N/A	N/A	<1 (0.01%)	N/A	N/A	N/A
				5 (0.02%)			

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation	Other Federal Recreation Areas						
(Continued)	Dinosaur National	0	N/A	N/A	0	0	0
	Monument	3 (<0.01%)			3 (<0.01%)	3 (<0.01%)	3 (<0.01%)
	Total	NA	116	876	NA	NA	116
			4,129	40,825			4,129
	State Recreation Areas						
	Recreation Area	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)	250-foot-wide ROW Acres (% of total area)
		2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)	2-mile Corridor Acres (% of total area)
	Emery Farm Castle Dale	N/A	N/A	0	N/A	N/A	N/A
	WMA			<1 (1%)			
	Currant Creek/Wildcat WMA	152 (0.73%)	N/A	N/A	N/A	N/A	N/A
		2,284 (10.7%)					
	Nephi WMA-Nephi Unit	0	N/A	N/A	N/A	N/A	N/A
		152 (100%)					
	Fillmore WMA	N/A	N/A	0	N/A	N/A	N/A
				221 (1.7%)			
	Gordon Creek WMA	N/A	N/A	N/A	155 (0.7%)	N/A	N/A
					5,315 (23.4%)		
	Indian Canyon WMA-	N/A	N/A	N/A	N/A	46 (0.6%)	N/A
	Cottonwood Canyon Unit					1,668 (22%)	
	North Nebo WMA/Fountain	N/A	41 (1.8%)	N/A	N/A	N/A	N/A
	Green		1,347 (58%)				
	North Nebo WMA—Spencer	111 (1.7%)	N/A	N/A	N/A	111 (1.7%)	111 (1.7%)
	Fork Unit	6,265 (96.4%)				6,265 (96.4%)	6,265 (96.4%)
	Northwest Manti WMA—	71 (1.9%)	N/A	N/A	N/A	71 (1.9%)	71 (1.9%)
	Birdseye Lake Fork Unit	2,695 (71.9%)				2,695 (71.9%)	2,695 (71.9%)
	Northwest Manti WMA —	53 (1.1%)	N/A	N/A	N/A	52 (1.1%)	52 (1%)
	Dairy Fork Unit	663 (13.3%)				1,600 (32.2%)	1,600 (32.2%)

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation (Continued)	Northwest Manti WMA—	N/A	N/A	N/A	17 (1.6%)	N/A	N/A
	Hilltop Conservation Easement				696 (64.8%)		
	Northwest Manti WMA—	0 (0%)	N/A	N/A	N/A	0 (0%)	0
	Lasson Draw	16 (0.7%)				16 (0.7%)	16 (0.7%)
	Northwest Manti WMA—					24 (0.4%)	24 (0.4%)
	Starvation Unit					976 (16.9%)	976 (16.9)
	Strawberry River WMA	5 (0.2%)	N/A	N/A	N/A	N/A	N/A
		454 (14.8%)					
	South Nebo WMA —	29 (1%)	42 (0.9%)	N/A	61 (1.2%)	61 (1.2%)	61 (1.2%)
	Triangle Ranch Unit	1,855 (37.7%)	2,734 (55.6%)		3,584 (72.9%)	3,584 (72.9%)	3,589 (72.9%)
	Tabby Mountain WMA—	111 (1.2%)	N/A	N/A	N/A	N/A	N/A
	Rabbit Gulch Unit	8,088 (89.4%)					
	Tabby Mountain WMA— Tabby Mountain Unit	53 (0.1%) 839 (2%)	N/A	N/A	N/A	N/A	N/A
	Starvation State Park	0 acres	N/A	N/A	N/A	N/A	N/A
		459 acres (6%)					
	CWMUs:						
	Double R Ranch	41/2,465 (39%)	N/A	N/A	N/A	N/A	N/A
	Crab Creek	0/211 (2%)	N/A	N/A	N/A	0/211 (2%)	0/211 (2%)
	Bear Mountain	N/A	82/4,515 (56%)	N/A	N/A	N/A	N/A
	Castle Valley Outdoors	N/A	N/A	178/6,067 (57%)	N/A	N/A	N/A
	Johnson Mountain Ranch	N/A	N/A	61/2,317 (17%)	N/A	N/A	N/A
	Oak Ranch	N/A	N/A	0/192 (4%)	N/A	N/A	N/A
	Old Woman Plateau	N/A	N/A	8/123 (2%)	N/A	N/A	N/A
	Round Valley	N/A	N/A	152/4,683 (59%)	N/A	N/A	N/A
	Minnie Maud Ridge	N/A	N/A	N/A	355/10,025 (63%)	26/1,096 (7%)	0/130 (4%)
	Emma Park	N/A	N/A	N/A	0/227 (1%)	232/7,267 (32%)	95/2,684 (12%)
	Antelope Creek	N/A	N/A	N/A	N/A	129/5,817 (18%)	N/A
	Scofield Canyons	N/A	N/A	N/A	N/A	0/556 (4%)	0/556 (4%)

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation	Soldier Summit	N/A	N/A	N/A	N/A	263/9,969 (38%)	193/5,477 (21%)
(Continued)	Local Recreation Areas						
	Big Mountain Campground	0	N/A	N/A	0	0	0
		15 (100%)			15 (100%)	15 (100%)	15 (100%)
	Bottle Hollow Reservoir	0	N/A	N/A	N/A	0	N/A
		101 (24%)				101 (24%)	
	Brough Reservoir	0	N/A	N/A	N/A	N/A	N/A
		<1					
	Cedar Ridges Golf Course	N/A	0	0	N/A	N/A	N/A
			Entire site	Entire site			
	Bear Creek Campground	N/A	0	N/A	N/A	N/A	N/A
			18 (100%)				
	Camp Timberlane	N/A	N/A	N/A	N/A	37 (5.1%)	31 (4.3%)
						381 (53%)	337 (47%)
	Scenic Byways and Backways						
	Recreation Area	250-foot-wide ROW (crossings)	250-foot-wide ROW (crossings)	250-foot-wide ROW (crossings)	250-foot-wide ROW (crossings)	250-foot-wide ROW (crossings)	250-foot-wide ROW (crossings)
		2-mile Corridor (miles)	2-mile Corridor (miles)	2-mile Corridor (miles)	2-mile Corridor (miles)	2-mile Corridor (miles)	2-mile Corridor (miles)
	Dinosaur Diamond	2 crossings	3 crossings	3 crossings	2 crossings	4 crossings	2 crossings
	Prehistoric Byway	5 miles	88 miles	76 miles	13 miles**	10 miles**	5 miles
	White River/Strawberry	1 crossing	N/A	N/A	N/A	N/A	N/A
	Road Scenic Backway	3 miles					
	Nebo Loop Scenic Byway	0 crossings	N/A	N/A	0 crossings	0 crossings	0 crossings
		<1 mile			<1 mile	<1 mile	<1 mile
	Energy Loop: Huntington/	N/A	1 crossing	N/A	7 crossings	1 crossing	N/A
	Eccles Canyons National Scenic Byway		4 miles		17 miles	<2 miles	
	Skyline Drive Scenic	N/A	1 crossing	N/A	1 crossing	0 crossings	0 crossings
	Backway		3 miles		4 miles	<1 mile	<1 mile
	Wedge Overlook/Buckhorn	N/A	N/A	5 crossings	N/A	N/A	N/A

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Recreation (Continued)	Drive Scenic Backway			9 miles			
	Gooseberry/Fremont Road	N/A	N/A	1 crossing	N/A	N/A	N/A
	Scenic Backway			2 miles			
	Indian Canyon Scenic	N/A	N/A	N/A	1 crossing	1 crossing	1 crossing
	Byway				7 miles**	<2 miles**	3 miles**
	Nine Mile Canyon Scenic	N/A	N/A	N/A	1 crossing	N/A	1 crossing
	Backway				2 miles		2 miles
	Reservation Ridge Scenic	N/A	N/A	N/A	N/A	N/A	6 crossings
	Backway						13 miles
	** Indian Canyon Scenic Byway shares the same route with Dinosaur Diamond Prehistoric Byway in this portion of the Byway; therefore, the acreage identified under the Indian Canyon route is also included in the Dinosaur Diamond route.						
Land Use and Planning							
(1.a) (6.a)	Federal and State lands and Use of Designated Utility Corridors	257 miles total: 47% located on BLM or USFS-managed lands; 11% located on state lands. 39 miles in BLM RMP corridors, and 56 miles in WWEC.	345 miles total; 67% located on BLM or USFS-managed lands; 11% located on state lands. 130 miles in BLM RMP corridors, and 38 miles in WWEC.	365 miles total: 68% located on BLM or USFS-managed lands; 11% located on state lands. 122 miles in BLM RMP corridors, and 17 miles in WWEC.	262 miles total: 59% located on BLM or USFS-managed lands, 1% on tribal lands and 13% on state lands.	266 mile total: 46% located on BLM or USFS-managed lands; 11 on state lands and 3% on tribal lands.	267 miles total; 53% on BLM/USFS lands; 16% state lands and 1% on Tribal lands
		26 miles RMP corridor; 56 miles WWEC.	142 miles RMP corridor; 34 miles WWEC.	149 miles RMP corridor; 16 miles WWEC	73 miles in BLM RMP corridors, and 49 miles in WWEC.	39 miles in BLM RMP corridors, and 66 miles in WWEC.	69 miles RMP corridor; 30 miles WWEC.
	Avoidance/Exclusion areas crossed by reference line	ROW would cross the Sand Wash/Sink Draw CWMU, a ROW exclusion area. 7 miles of exclusion areas.	Designated avoidance areas crossed for <1 miles; designated exclusion areas crossed for 1 mile (Demaree WSA)	Same as Alternative II-B	6 miles; would cross the Gordon Creek WMA, an exclusion area for overhead power lines.	None	11 miles; no exclusion area

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Land Use (Continued) (6.a)	Private Lands and Zoning	109 miles (42 %) located on private land.	76 miles (22%) located on private land. 5 residences and 19 commercial building within 500 feet of the reference line.	77 miles (21%) located on private land. 4 residences and 14 commercial building within 500 feet of the reference line.	71 miles (27%) located on private lands. 6 residences and 1 commercial building within 500 feet of the reference line.	106 miles (40%) located on private lands	79 miles (30%) on private land
		9 communities within the 2 mile transmission line corridor; no identified incompatible land uses within these communities. 11 parks (9 wildlife management areas and one state park and one BLM recreation area), one cemetery, one school, and one church within the 2 mile transmission line corridor; 53 residences and 31 commercial building within 500 feet of the reference line.	11 communities within the 2 mile transmission line corridor; no identified incompatible land uses within these communities. Two wildlife management areas and two cemeteries within the 2-mile transmission line corridor.	11 communities within the 2 mile transmission line corridor; no identified incompatible land uses within these communities. Two wildlife management areas and 1 cemetery within the 2-mile transmission line corridor.	10 communities within the 2 mile transmission line corridor; no identified incompatible land uses within these communities. 3 wildlife management areas, two cemeteries, one church, and two schools within the 2-mile transmission line corridor; one WMA is a ROW exclusion area for overhead power lines.	15 communities within the 2-mile transmission line corridor in region, no identified incompatible land uses within these communities. One local park, seven WMAs, three cemeteries, one school, and two churches within the 2-mile transmission line corridor; 35 residences and 20 commercial building within 500 feet of the reference line.	10 communities within 2 miles; 13 residences within 500 feet.
	Agriculture	452 acres of initial clearing, 328 acres of construction disturbance, and 93 acres of permanent removal of croplands. Three center pivots crossed by the 250-foot-wide ROW.	169 acres of initial clearing, 139 acres of construction disturbance, and 51 acres of permanent removal of croplands.	238 acres of initial clearing, 177 acres of construction disturbance, and 50 acres of permanent removal of croplands. Five center pivots crossed by the 250-foot-wide ROW.	82 acres of initial clearing, 72 acres of construction disturbance, and 29 acres of permanent removal of croplands.	285 acres of initial clearing, 216 acres of construction disturbance, and 66 acres of permanent removal of croplands. Two center pivots crossed by the 250-foot-wide ROW.	104 acres of clearing; 82 acres of construction disturbance; 32 acres of permanent removal.
	Livestock Grazing	Construction impacts 1,728 acres (86 AUMs); Operation impacts 449 acres (25 AUMs)	Construction impacts 4,018 acres (201 AUMs); Operation impacts 1,103 acres (55 AUMs)	Construction impacts 4,229 acres (211 AUMs); Operation impacts 1,086 acres (54 AUMs)	Construction impacts 2,922 acres (146 AUMs); Operation impacts 819 acres (41 AUMs)	Construction impacts 1,804 acres (90 AUMs); Operation impacts 493 acres (25 AUMs)	Construction impacts 2,800 acres (140 AUMs); Operation impacts 834 acres (42 AUMs)

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Land Use (Continued) (6.a)	USFS land Management	Within the Uinta NF, the reference line, the 250-foot-wide ROW, and the 2-mile transmission corridor would pass through areas managed for aquatic and terrestrial resources (9 miles), dispersed recreation (5 miles) areas; forested area vegetation (2 miles); non forested ecosystems (3miles) and utility corridor/ communication sites(less than 1 mile). With the exception of portions of the Strawberry Management Area within 300 yards of greater sage-grouse foraging areas, development of a transmission line would in generally be compatible with area management. Application of mitigation LU-1 would eliminate impacts to this management area. Within the Manti-La Sal NF, the reference line, the 250-foot-wide ROW, and the 2-mile transmission corridor would fall within areas managed for General Big Game Winter Range (2 miles) , and Key Big Game Winter Range (less than 1	Within the Manti-La Sal NF, the reference line, the 250-foot-wide ROW, and the 2-mile transmission corridor would pass through areas managed for general big game winter range (1 mile), mineral development (1 mile), forage production areas (16 miles), and designated utilities corridors and developed recreation site management areas (less than one mile). Development of a transmission line would be fully compatible within areas managed as utility corridors, and generally compatible with management goals for minerals management, range forage production areas, and motorized recreation areas, provided that access to resources is not restricted. Compatibility with Big Game Winter Range would be the same as under Alternative II-A.	Within the Fishlake NF, the reference line, the 250-foot-wide ROW, and the 2-mile transmission corridor would pass through areas managed for management indicator species (MIS; 13 miles); livestock grazing (10 miles); improved watershed condition (4 miles), big game winter range (2 miles), and rural and roaded-natural recreation opportunities (2 miles). Development of a transmission line would be generally compatible with management goals for these areas, provided that access to resources not restricted, and vegetation densities are maintained and short-term or temporary roads are obliterated within one season of use in MIS and big game winter range MAs. Construction activities would have temporary impacts to the recreation opportunities in some areas of the 2b Roaded Natural Recreation management areas through visual and noise	Within the Manti-La Sal NF, the 250-foot-wide ROW, and the 2-mile transmission corridor would pass through Developed Recreation Sites (specifically, the Flat Canyon and Gooseberry Campgrounds); Special Land Designation (the Mammoth Guard Station); Research, Protection, and Interpretation of Lands and Resource; and Undeveloped Motorized Recreation Sites management areas. Construction of a transmission line would not be compatible with the management goals of developed recreation management areas, which restrict non-recreation noise to 30 decibels or less. Construction of a transmission line would generally be compatible with the other management areas, provided it does not inhibit attainment of objectives for the area.	Within the Manti-La Sal, impacts to management units and consistency with applicable standards and guidelines would be the similar to Alternative II-A, but would slightly more Manti-La Sal NF acreage within the general big game winter range and range forage production areas within the 2-mile transmission line corridor. Within the Uinta NFs, impacts to management units and consistency with applicable standards and guidelines would be the similar to Alternative II-A, but would include slightly less mileage within areas managed for aquatic/terrestrial resources and dispersed recreation. Within the Ashley NF, the reference line, the 250-foot-wide ROW, and the 2-mile transmission corridor would pass through approximately nine miles of areas with a low management emphasis (N)	Approximately 15 miles of the 250-foot-wide transmission line ROW would be within national forest system lands with special management prescriptions within the Fishlake, Uinta, and Manti-La Sal NFs. Consistency with applicable standards and guidelines within the Uinta and Manti-La Sal NFs would be the same as under Alternative ll-D. Consistency with applicable standards and guidelines within the Fishlake NF would be the same as under Alternative ll-B. Consistency with applicable standards and guidelines within the Ashley NF would be similar that described under Alternative II-D and II-E.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
		mile). Development of a transmission line would generally be compatible with area management, provided vegetation densities are maintained and short term or temporary roads are reclaimed, construction occurs outside of the critical season, and there is no long term degradation of habitat..	Construction of a transmission line would not be compatible with the management goals of developed recreation management areas (specifically the Indian Creek Campground), which restrict non-recreation noise to 30 decibels or less. Within the Fishlake NF, 4 miles of the reference line, the 250-foot-wide ROW, and the 2-mile transmission corridor would be within areas managed for livestock grazing. Development of a transmission line would generally be compatible with Standard and Guidelines for this area.	disturbances, traffic delays, or trail access restrictions. The 2-mile transmission line corridor would also encompass acreage within Semi-Primitive Non-Motorized Recreation Fish Habitat Improvement management areas. Development of access roads or other construction support areas would generally be compatible with Standard and Guidelines for these areas provided that riparian areas are avoided and roads are closed to motorized public access.	Within the Ashley NF, portions of the 2-mile transmission line corridor (and a very small portion of the 250- foot-wide transmission line ROW) would fall within areas managed for livestock grazing and wildlife habitat. Development of a transmission line would be compatible with the management goals, provided that key stress seasons are avoided, short term or temporary roads are reclaimed and riparian areas are protected within wildlife habitat areas.	and one mile of area managed for dispersed roaded recreation (F). Development of a transmission line within these areas would generally be compatible with management goals.	
(5.f)	Greenfield	32 miles (12%)	156 miles (45%)	156 miles (43%)	151 miles (58%)	45 miles (17%)	121 miles (45%)

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas							
	White River FO	No impacts	0 miles and >1 acre of ROW within Oil Spring Mountain WSA/ACEC, located within a designated underground utility corridor outside the WSA/ACEC but extending partially within the WSA. 7% of the WSA/ACEC (1,241 acres) within 2-mile corridor. Impacts to ACEC's R&I values (spruce-fir and biologically diverse plant communities, BLM sensitive species, and remnant vegetation associations) from habitat removal. Development of transmission line, roads or use of motorized vehicles would not be compatible with WSA designation. Visual impacts to the WSA from operation of the line; temporary impacts to wilderness quality in the areas closest to the ROW from noise and activity.	Impacts to Oil Spring Mountain WSA same as under Alternative II-B.	No impacts	No impacts	No impacts

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued)			0 mile ROW within the White River ACEC; 143 acres (15% of ACEC) within 2-mile corridor. The ACEC is a ROW avoidance area; road construction would have potential to impact the riparian areas and bald eagle roost R&I values. Construction would be contingent upon avoidance of cottonwood communities, maintenance of utility as bald eagle habitat and properly functioning riparian community.	Impacts to White River Riparian ACEC same as under Alternative II-B.			
	Grand Junction FO	No impacts	1 mile and 15 acres of ROW within Demaree WSA; 9% of WSA (1,812 acres) within 2-mile corridor, Development of transmission line, roads or use of motorized vehicles would not be compatible with area management; wilderness quality in the areas closest to the ROW could be temporarily reduced during construction from noise and activity.	Impacts to Demaree WSA same as same as under Alternative II-B.	No impacts	No impacts	No impacts

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued)			0 mile ROW within the Badger Wash ACEC; 310 acres (20% of ACEC) within 2-mile corridor. This area is not within a designated utility corridor. Surface disturbance would impact sensitive plant communities and hydrologic research R&I values in these areas.	Same as Alternative II-B.			
			0 mile ROW and 2% of McInnis Canyon NCA (1,925 acres) within 2 mile corridor, entirely within designated utility corridor. Road development of roads consistent with area management, subject to agency constraints and BMPs.	Impacts Badger Wash ACEC same as under Alternative II-B.			
				Impacts to McInnis Canyon NCA same as under Alternative II-B.			

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued)	Vernal FO	No impacts	No impacts	No impacts	1 mile ROW crossing Green River WSR-suitable area. 1,447 acres (12% of suitable area) within 2 mile corridor Crossing is within designated corridor but would not be in conformance with VRM II area or consistent with criteria for 'scenic" designation.	No Impacts	Impacts would be the same as those for Alternative II-D.
					1 mile of ROW within Lower Green River ACEC, a ROW avoidance area. 1,239 acres (15% of ACEC) within 2-mile corridor .Impacts from surface disturbance and vegetation removal would affect special status species habitat and scenic R&I values. Would not be in conformance with VRM management in VRM II area.		Impacts would be the same as those for Alternative II-D.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued)					489 acres of Lear Canyon ACEC (35% of the ACEC) within 2-mile corridor. The ACEC is a ROW avoidance area for protection of surface disturbance from road construction would affect R&I values of relict vegetation and conflict with management that closes the ACEC to motorized travel.		Impacts would be the same as those for Alternative II-D.
					1,453 acres of Nine Mile Canyon ACEC (2% of the ACEC) within 2-mile corridor, above the rim of the canyon but with potential for impacts to the R&I cultural resources and special status species values.		Impacts would be the same as those for Alternative II-D.
	Price FO	No impacts	No impacts	0 miles ROW within the San Rafael Canyon ACEC; 8% of the ACEC (1,192 acres) within the 2-mile corridor. The ACEC is a ROW avoidance area; development of roads would reduce the scenic qualities for which the ACEC was designated.	No impacts	No impacts	No impacts

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued)				0 miles ROW within the Rock Art ACEC; 123 acres of the Dry Wash unit would be within the 2-mile corridor. The ACEC is a ROW avoidance area; the 2-mile corridor would not be located within a designated utility corridor. Development of roads would not be in conformance with area management objectives and could result in destruction of cultural resources as well as increased vandalism due to increased access.			
(5.e)	Uinta National Forest	2 miles of ROW within Chipman Creek IRA. Route located on IRAs' edge (paralleling existing transmission line), leaving most of the IRA unfragmented; however proposed route would widen the existing designated corridor between six, mostly unfragmented, IRAs. All ROW areas within IRA within roaded natural and roaded modified ROS. Impacts to IRA during operations from vegetation maintenance within ROW.	No impacts	No impacts	0 miles of ROW; 2-mile transmission line corridor would encompass portions of 2 IRAs. TWE would eliminate roads in these areas.	0 miles of ROW; 2-mile transmission line corridor would encompass portions of five IRAs. TWE would eliminate roads in these areas.	0 miles of ROW; 2-mile transmission line corridor would encompass portions of 6 IRAs. TWE would eliminate roads in those areas.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued)		The 2-mile transmission line would cross 7 additional IRAs (11,747 acres); TWE would eliminate roads in these areas.					
(5.e)	Manti-La Sal National Forest	1 mile of 250-foot ROW within the Coal Hollow IRA and 1 mile of ROW within Cedar Knoll IRA. Route located on IRAs' edge (paralleling existing transmission line), leaving most of the IRAs unfragmented. 25 acres of ROW within semi-primitive motorized ROS; TWE commitment to use of 100 foot ROW would reduce surface disturbance impacts. Impacts to IRAs during operations from vegetation maintenance within ROW.	0 miles of ROW.	No impacts	0 miles of ROW; 2-mile transmission line corridor would encompass portions of 3 IRAs. TWE would eliminate roads in these areas.	2 miles of ROW within 3 IRAs. Impacts same as under Alternative II-A.	Impacts would be the same as those for Alternative II-E.
		The 2-mile transmission line would cross one additional IRAs (2,437 acres); TWE would eliminate roads in these areas.	The 2-mile transmission line corridor would encompass portions of three IRAs; TWE would eliminate roads in these areas.				
(5.e)	Fishlake National Forest		0 miles of ROW. The 2-mile transmission line corridor would encompass portions of one IRA; TWE would eliminate roads in these areas.	0 miles of ROW. The 2-mile transmission line corridor would encompass 1,257 acres IRA.	No impacts	No impacts	Impacts would be the same as those for Alternative II-B.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued) (5.e)	Ashley National Forest	No impacts	No impacts	No impacts	1 mile and 11 acres of ROW along southern edge of IRA 401009, leaving the majority of the IRA unfragmented. One acre within Semi-Primitive Motorized ROS; TWE commitment to use of 100 foot ROW would reduce or eliminate surface disturbance impacts in this portion of the ROW. TWE would eliminate roads in IRAs.	3 miles of ROW within IRA 401010. Would parallel an existing transmission line and road, widening the disturbance area that bisects one large, mostly unfragmented, habitat area. Separation distances from existing transmission line could result in ROW being located on steeper side slopes, resulting in additional erosion and sedimentation to Sowers Creek, an impaired stream. TWE commitment to use of 100 foot ROW would reduce surface disturbance impacts. Impacts to IRAs during operations from vegetation maintenance within ROW. TWE would eliminate roads in IRAs. Acreage fully within roaded natural ROS areas. The 2-mile transmission line would cross 1 additional IRA.	1 mile and 11 acres of ROW along southern edge of IRA 401009, leaving the majority of the IRA unfragmented. The 2-mile transmission line would cross 3 additional IRAs.
	Other Federally managed areas	No impacts	No impacts	No impacts	3 acres Dinosaur NM within 2-mile corridor.	Impacts to Dinosaur NM same as Alternative II-D.	Impacts would be the same as those for Alternative II-D.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Special Designation Areas (Continued) (5.d)	NHTs	No Impacts	4 segments of the Old Spanish NHT crossed; 1 segment NHT II, 1 segment NHT III, 2 segments NHT V. Visible along 58 miles of trail, of which 7 miles are NHT II, 6 miles are NHT III, 27 miles are NHT IV, and 18 miles are NHT V	9 segments of the Old Spanish NHT crossed; 1 segment NHT II, 1 segment NHT III, 3 segments NHT V, 4 segments not categorized. Visible along 107 miles of trail, of which 17 miles are NHT II, 8 miles are NHT III, 31 miles are NHT IV, and 27 miles are NHT V; and 24 miles are not categorized	No Impacts	No Impacts	No Impacts
Transportation							
	Total Miles of New Permanent Access Roads	464	580	557	480	479	514
	Total Miles of Steep and Mountainous Terrain	239	270	192	281	259	313
	Road Crossings	21	16	19	16	17	16
	Number of Railroad Crossings	4	21	10	8	8	11
	Center Line Passing Through Public Land (miles)	148	270	287	191	160	182
	Center Line Passing Through Private Land (miles)	109	76	77	71	106	89
	Number of Airports within 5 miles	6	9	7	2	3	3
	Military Operations Areas (MOAs) within 20 Miles	1 – Hill AFB Sevier	1– Hill AFB Sevier Utah Launch Complex	1– Hill AFB Sevier Utah Launch Complex	1 – Hill AFB Sevier	1 – Hill AFB Sevier	1 – Hill AFB Sevier
	Military Operations Areas (MOAs) with 250-foot-Wide Transmission ROW Overlap	1 – Hill AFB Sevier	2 - Utah Launch Complex Hill AFB Sevier	2 - Utah Launch Complex Hill AFB Sevier	1 – Hill AFB Sevier	1 – Hill AFB Sevier	1 – Hill AFB Sevier

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Socioeconomics							
	Short-term socioeconomic effects	Temporary effects similar in nature to those associated with transmission line construction for Alternative I-A; mostly transient as construction progresses along the corridor. No effects related to terminal construction, unlike for Alternative I-A.	Total economic effects up to 30% higher than those in Alternative II-A due to the increased length and cost of the power line.	Total economic effects up to 30% higher than those in Alternative II-A due to the increased length and cost of the power line.	Similar to Alt. II-A, but would affect different communities in central Utah.	Similar to Alt. II-A, but would affect different communities in central Utah.	Similar to Alt. II-A, but would affect different communities in central Utah.
		Temporary increases in sales, use and lodging taxes, but lower tax revenues than for Alternative I-A because no terminal located in Region II.	Higher than in Alternative II-A, with relatively more effect in Colorado.	Higher than in Alternative II-A, with relatively more effect in Colorado.	Comparable to Alternative II-A.	Slightly higher than Alternative II-A	Slightly higher than Alternative II-A
		Temporary housing availability may be limited in northeastern Utah due to competing demands. Some areas in central with limited supply.	Temporary housing availability limited in northeastern and central Utah.	Temporary housing availability limited in northeastern and central Utah. Commuting may be easier due to highway access.	Comparable to Alternative II-A.	Comparable to Alternative II-A.	Comparable to Alternative II-A.
		Potential effects to agriculture could include temporary reductions of grazing on public lands and very minor effects on private farm lands.	More effects on livestock grazing and lesser effects on private farm lands.	More effects on livestock grazing and lesser effects on private farm lands.	More effects on livestock grazing (but less than II-B and II-C) and lesser effects on private farm lands (but more than II-B and II-C).	More effects on livestock grazing (but less than II-B and II-C) and lesser effects on private farm lands (but more than II-B and II-C).	
	Long-term socioeconomic effects	Long-term effects similar to those for Alternative I-A.	Generally the same as, but higher tax revenues than Alternative II-A.	Generally the same as, but higher tax revenues than Alternative II-A.	Comparable to Alternative II-A.	Comparable to Alternative II-A.	Comparable to Alternative II-A.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Socio-economics (Continued)		Substantial ad valorem taxes paid, but no taxes on terminals or ground electrodes.	Relatively more revenue would accrue to Colorado jurisdictions than under Alternative II-A.	Relatively more revenue would accrue to Colorado jurisdictions than under Alternative II-A.	Comparable to Alternative II-A.	Comparable to Alternative II-A.	Comparable to Alternative II-A.
		Tax and business revenues accrue primarily in Utah.	Relatively more revenue would accrue to Colorado jurisdictions than under Alternative II-A.	Relatively more revenue would accrue to Colorado jurisdictions than under Alternative II-A.	Comparable to Alternative II-A.	Comparable to Alternative II-A.	Comparable to Alternative II-A.
		Federal government and other lessors receive rental/ lease income on ROW.	Higher than Alternative II-A due to increased length of the ROW.	Higher than Alternative II-A due to increased length of the ROW.	Essentially the same as Alternative II-A.	Essentially the same as Alternative II-A.	Essentially the same as Alternative II-A.
		Alternative crosses area near the Uintah & Ouray Reservation, but would not result in effects warranting detailed consideration under Environmental Justice.	Avoids the Uintah and Ouray Reservation. No effects warranting further consideration under Environmental Justice.	Avoids the Uintah and Ouray Reservation. No effects warranting further consideration under Environmental Justice.	Avoids much of the Uintah and Ouray Reservation. No effects warranting further consideration under Environmental Justice.	Essentially the same as Alternative II-A.	Avoids much of the Uintah and Ouray Reservation. No effects warranting further consideration under Environmental Justice.
Health and Safety							
	Serious injuries to workers and the public at-large	Workers during construction and operation may be injured by heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical hazards found on a construction site. Sand dunes within this alternative also may affect the safety of workers and the public during construction and operation. The workers and the public may be injured by fire as well as downed power lines.	Same as Alternative II-A except that safety issues related to sand dunes would not result from this alternative.	Same as Alternative II-A except that safety issues related to sand dunes would not result from this alternative.	Same as Alternative II-A.	Same as Alternative II-A.	Same as Alternative II-A.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Health and Safety (Continued)	Adverse health impacts from EMF, stray voltage, and induced voltage associated with transmission lines.	One outbuilding, four commercial/industrial structures, and four residential structures would be within 200 feet of the reference line, resulting in potential impacts from EMF, stray voltage, and induced voltage.	One outbuilding, five commercial/industrial structures, and three residential structures would be within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be similar to slightly less than Alternative II-A.	Three outbuildings, four commercial/industrial structures, and one residential structure would be within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be slightly less than Alternative II-A.	There would be no structures within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be less than Alternative II-A.	One outbuildings and five residential structures would be within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be similar to slightly less than Alternative II-A.	Four outbuildings would be located within 200 feet of the reference line, resulting in potential for impacts from EMF, stray voltage, and induced current that would be less than Alternative II-A.
(4.a) (4.b)	Noise impacts to nearby communities and residences.	There would be 9 communities within the 2-mile transmission line corridor; 53 residential structures within 500 feet of the reference line, and four residential structures within 200 feet of the reference line, resulting in potential impacts from noise with this alternative.	There would be 11 communities within the 2-mile transmission line corridor; five residential structures within 500 feet of the reference line, and three residential structures 200 feet of the reference line, resulting in impacts from noise that would be less than Alternative II-A.	There would be 11 communities within the 2-mile transmission line corridor; four residential structures within 500 feet of the reference line, and one residential structure 200 feet of the reference line, resulting in impacts from noise that would be similar to less than Alternative II-A.	There would be 1 communities within the 2-mile transmission line corridor; six residential structures within 500 feet of the reference line resulting in impacts from noise that would be less than Alternative II-A.	There would be 16 communities within the 2-mile transmission line corridor; 35 residential structures within 500 feet of the reference line, and five residential structures 200 feet of the reference line, resulting in impacts from noise that would be similar to less than Alternative II-A.	There would be 10 communities within the 2-mile transmission line corridor and 13 residential structures within 500 feet of the reference line, resulting in impacts from noise that would be less than Alternative II-A.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Wild Horses							
	Temporary and permanent loss of forage areas	N/A	31 acres of 250-foot-wide ROW within the Piceance-East Douglas Creek HMA (<0.02% of the HMA). <1 acres of temporary and permanent disturbance. 218 acres of 250-foot-wide ROW within the North Douglas HA (0.3% of the HMA). 91 acres of temporary disturbance, 23 acre permanent. 390 acres of 250-foot-wide ROW within the West Douglas HA (<0.3% of the HMA). 192 acres of temporary disturbance, 49 acre permanent.	Same as Alternative II-B.	No acres of 250-foot-wide ROW within the Hill Creek HMA. One acre of temporary disturbance, no permanent disturbance.	N/A	Same as Alternative II-D.
	Temporary construction noise and human activity	N/A	1,049 acres of 2-mile transmission line corridor within the Piceance-East Douglas Creek HMA (0.6% of HMA). 5,902 acres of 2-mile transmission line corridor within the North Douglas HA (7.7% of HA). 13,966 acres of 2-mile transmission line corridor within the West Douglas HA (11% of HA).	Same as Alternative II-B.	123 acres of 2-mile transmission line corridor within the Hill Creek HMA (0.1% of HMA).	N/A	Same as Alternative II-D.

Table 2-24 Summary of Impacts for Region II

Resource	Resource Topic	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Wild Horses (Continued)	Presence of transmission line within HMAs / HAs restrict helicopter use during wild horse gathers	N/A	One mile of transmission line within the Piceance-East Douglas Creek HMA. 7 miles of transmission line within the within the North Douglas HA 13 miles of transmission line within the within the West Douglas HA	Same as Alternative II-B.	No miles of transmission line within the Hill Creek HMA.	N/A	Same as Alternative II-D.
Lands with Wilderness Characteristics							
(5.e)	Number of LWC Units Affected	2	8	8	4	2	5
(5.e)	Number (acres) of LWC Units Eliminated	0	1 (5,304)	1 (5,304)	0	0	0
(5.e)	Number (acres) of LWC Units Remaining	3 (39,962)	8 (180,209)	8 (121,843)	5 (224,448)	3 (39,962)	6 (234,250)
(5.e)	Number (acres) of Unit Portions Eliminated	2 (323)	12 (2,841)	11 (7,550)	9 (857)	2 (323)	12 (1,286)
Plan Amendments							
(2.a)	Location, length, and reason for plan amendment	VFO (19 miles)—New utility corridor	WRFO (38 miles)—Convert/expand underground only corridor VFO (6 miles)—New utility corridor PFO (14 miles)—Designate new utility corridor	WRFO (38 miles)—Convert/expand underground only corridor VFO (6 miles)—New utility corridor PFO (10 miles)—Designate new utility corridor Fishlake National Forest (22 miles) — Expand existing corridor	VFO (17 miles)—New utility corridor	VFO (6 miles)—New utility corridor	VFO (22 miles)—New utility corridor SLFO (3 miles)—New utility corridor

[1] Number does not include MIS that are otherwise classified as special status.

[2] Number includes nests for which the species is not known.

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Region III				
Climate and Air				
	Fugitive Dust Emissions (PM_{10})	119.4 tons	117.1 tons	128.7 tons
Geology				
	Geologic Hazards Risk	Two active faults, slight landslide, slight subsidence. Low risk for ground motion.	One active fault, slight landslide, moderate subsidence. Low risk for ground motion.	One active fault, slight landslide, moderate subsidence. Moderate risk of ground motion.
	Mineral Resource Access	No oil and gas or coal mining. Potential conflict with active mining areas near Milford, Utah.	Same as Alternative III-A.	Same as Alternative III-A.
	Paleontological Resources Loss	4 miles PFYC Class 5.	1 mile PFYC Class 5.	1 mile PFYC Class 5.
Soils				
	Soils – Wind Erodible	114 acres	140 acres	105 acres
	Soils – Water Erodible	77 acres	36 acres	62 acres
	Soils-Compaction Prone	864 acres	1,106 acres	1,039 acres
	Soils-LRP	1,586 acres	1,453 acres	1,579 acres
	Soils- Prime Farmland	132 acres	113 acres	286 acres
Water				
	Erosion and Sedimentation Direct Effects from Crossings	Three perennial stream crossings	Five perennial stream crossings	No perennial stream crossings
	Impaired Stream Effects from Crossings	Two impaired stream crossed	One impaired stream crossed	No impaired streams crossed
	Effects to Water Users from Construction Water Use	206 acre-feet required	212 acre-feet required	230 acre-feet required
	Maximum Road Density Change in Watershed (HUC10, 300-foot, or 100-foot perennial buffer area)	1.61 mile/mile^2 (100 feet: the Big Wash-Beaver River Watershed)	1.61mile/mile^2 (100 feet: the Big Wash-Beaver Watershed)	1.61 mile/mile^2 (100 feet: the Big Wash-Beaver River Watershed)
Vegetation				
	Vegetation clearing of woody vegetation over 6 feet in height	276 acres of pinyon-juniper, and 12 acres of woody riparian and wetlands	331 acres of pinyon-juniper and 53 acres of woody riparian and wetlands	337 acres of pinyon-juniper and 12 acres of woody riparian and wetlands

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Vegetation (Continued)	Wetlands and Riparian Areas impacted by Facilities Construction (acres)	210 acres of greasewood flats, 46 acres of herbaceous wetlands, 41 acres of riparian, and 9 acres of woody riparian and wetlands	229 acres of greasewood flat, 55 acres of herbaceous wetlands, 50 acres of riparian, and 28 acres of woody riparian and wetlands	287 acres of greasewood flat, 75 acres of herbaceous wetlands, 11 acres of riparian, and 7 acres of woody riparian and wetlands
	Wetlands and Riparian Areas impacted by Operations (acres)	48 acres of greasewood flats, 10 acres of herbaceous wetlands, 13 acres of riparian, and 3 acres of woody riparian and wetlands	51 acres of greasewood flat, 12 acres of herbaceous wetlands, 11 acres of riparian, and 6 acres of woody riparian and wetlands	70 acres of greasewood flat, 19 acres of herbaceous wetlands, 3 acres of riparian, and 2 acres of woody riparian and wetlands
	USFS MIS Species	NA	NA	NA
Special Status Plants				
	Number of USFWS species with known occurrences impacted	1	1	1
	Number of USFWS species with potential habitat impacted	3	2	2
	Number of BLM Sensitive species with known occurrences impacted	9	9	7
	Number of BLM Sensitive species with potential habitat impacted	31	38	38
	Number of USFS Sensitive species with known occurrences impacted	1	0	0
	Number of USFS Sensitive species with potential habitat impacted	2	0	0
	Number of Nevada state listed species with known occurrences impacted	3	3	1
	Number of Nevada state listed species with potential habitat impacted	4	6	6
Wildlife				
(5.a)	Pronghorn crucial winter range (acres) construction/operation	1,627/378	1,897/433	1,868/439
	Mule deer crucial winter range (acres) construction/operation	185/51	0/0	0/0

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Wildlife (Continued)	Desert bighorn sheep occupied range – Nevada (acres)	106/33	140/40	106/30
	Small game, nongame habitat (acres) construction/operation	9,320/979	9,502/862	10,318/940
	Waterfowl habitat (acres) construction/operation	249/26	360/30	239/23
(5.b)	Number of raptor nests within 1 mile of the reference line	254	129	199
	IBAs crossed by the 2-mile transmission line corridor	0	Same as Alternative III-A	Pahranagat Valley Complex (188 acres)
	Number of MIS species whose habitat is crossed by alternative[2]	2	Same as Alternative III-A	Same as Alternative III-A
Special Status Wildlife				
(3.d)	Impacted desert tortoise potential habitat (acres) construction/operation	993/299	1,081/279	985/242
(3.a)	Impacted greater sage-grouse habitat (acres) construction/operation	346/73	0/0	Same as Alternative III-B
	Number of active leks within 4 miles of reference line in Utah	1	0	0
(3.e)	Impacted Utah prairie dog potential habitat (acres) construction/operation	77/31	86/36	101/44
	Impacted California condor potential habitat (acres) construction/operation	4,810/525	4,308/401	4,624/426
	Impacted Yuma clapper rail potential habitat (acres) construction/operation	22/3	81/6	19/2
	Impacted western yellow-billed cuckoo potential habitat (acres) construction/operation	22/3	81/6	19/2
	Impacted southwestern willow flycatcher potential habitat (acres) construction/operation	22/3	81/6	19/2

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Special Status Wildlife (Continued) (3.b)	Number of special status raptor nests within 1 mile of the reference line[1]	208	119	125
Aquatic Biological Resources				
	Effects on aquatic habitat and species from potential direct and indirect disturbance or water quality changes	4 perennial streams crossed by 250-foot-wide ROW; no game fish streams crossed by the 250-foot-wide ROW	3 perennial streams crossed by 250-foot-wide ROW; 2 game fish streams crossed by the 250-foot-wide ROW	1 perennial stream crossed by 250-foot-wide ROW; 1 game fish stream crossed by the 250-foot-wide ROW
	Potential aquatic habitat alteration or loss (feet^2)	1,600	1,200	400
	Potential amphibian mortalities from vehicle traffic	275 ROW miles	282 ROW miles	309 ROW miles
Special Status Aquatic Resources				
	Effects on habitat and special status species from potential direct disturbance or water quality changes	4 perennial streams with special status aquatic species crossed by 250-foot ROW	3 perennial streams with special status aquatic species crossed by 250-foot ROW	1 perennial stream with special status aquatic species crossed by 250-foot ROW
		One stream with one species under review for federal listing	One stream with one species under review for federal listing	No streams with federally listed or petitioned aquatic species
	Number of special status aquatic species with potential habitat alteration or loss	9	4	3
	Number of watersheds supporting special status aquatic species with increased road densities	1	2	0
	Potential direct disturbance on critical habitat for federally listed species	None	None	None
Cultural Resources				
	NRHP-listed Sites	0	1	1
	NRHP-eligible Sites	23	15	29
	Unevaluated Sites	11	14	11
	Potential TCPs	3	11	5
	Trail Crossings	Old Spanish Trail (3) (1 NHT-I, 2 not categorized)	Old Spanish Trail (0)	Old Spanish Trail (0)

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Cultural Resources (Continued)	Mountain Meadows NHL and Site (distance from alternative)	0.1 mile	31 miles	28 miles
	Average Inventory Coverage	20%	23%	20%
	Site Density (sites per 100 acres inventoried)	0.022	1.7	0.01
	Overall Trail Visibility (within 5-mile viewshed)	23 miles	6.2 miles	0 miles
Visual Resources				
	High Sensitivity Viewers			
	0–0.5 miles	32	22	51
	0.5–2.5 miles	82	99	106
	2.5–5 miles	69	105	83
	>5 miles	93	58	68
	Moderate Sensitivity Viewers			
	0–0.5 miles	52	84	110
	0.5–2.5 miles	93	92	81
	2.5–5 miles	72	48	72
	>5 miles	59	61	46
	Scenic Quality (miles)			
	A	1	13	11
	B	100	85	96
	C	174	187	202
	BLM VRI Classifications (miles)			
	Class II	17	26	28
	Class III	90	75	66
	Class IV	150	169	209
	BLM VRM Classifications (miles)			
	Class II	3	3	--
	Class III	73	64	92
	Class IV	132	144	146

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Visual Resources	USFS SIO/VQO Classifications (miles)			
(Continued)	High Retention	1	--	--
	Moderate Partial Retention	16	--	--
	Low Modification	--	--	--
	Residual Impacts Landscape Scenery (miles)			
	High	60	59	82
(5.c)	Moderate	60	100	111
	Low	155	126	116
	Residual Impacts High Sensitivity Viewers (miles)			
	High	23	14	42
(5.c)	Moderate	70	116	131
	Low	182	154	135
	Residual Impacts Moderate Sensitivity Viewers (miles)			
	High	25	55	89
	Moderate	73	67	64
	Low	178	163	155
	BLM VRM USFS SIO/VQO Compliance/Consistency (miles) Before Mitigation			
	Compliant	219	210	229
	Non-compliant	7	1	8
	NA	50	73	71
	BLM VRM USFS SIO/VQO Compliance/Consistency (miles) After Mitigation			
	Compliant	220	210	229
	Non-compliant	6	1	8
	NA	50	73	71
Recreation				
	Recreation Area/Site in Region III	250-foot-wide ROW Acres (% of Total Area)	250-foot-wide ROW Acres (% of Total Area)	250-foot-wide ROW Acres (% of Total Area)
		2-mile Corridor Acres (% of Total Area)	2-mile Corridor Acres (% of Total Area)	2-mile Corridor Acres (% of Total Area)

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Recreation (Continued)	BLM Fillmore FO			
	Dispersed, undesignated recreation areas	2,126 (0.05%)	2,096 (0.05%)	2,091 (0.05%)
		96,673 (2.2%)	101,464 (2.3%)	101,450 (2.3%)
	BLM Cedar City FO			
	Dispersed, undesignated recreation areas	1,256 (0.06%)	1,122 (0.05%)	1,122 (0.05%)
		57,249 (2.7%)	53,732 (2.6%)	53,616 (2.5%)
	BLM St. George FO			
	Dispersed, undesignated recreation areas	747 (0.2%)	N/A	N/A
		32,409 (6.4%)		
	BLM Caliente FO			
	Dispersed, undesignated recreation areas	651 (0.02%)	2,032 (0.06%)	2,739 (0.08%)
		25,917 (0.7%)	81,729 (2.3%)	114,595 (3.2%)
	Chief Mountain SRMA	N/A	N/A	488 (0.4%)
				18,618 (2%)
	North Delamar SRMA	N/A	N/A	0
				<1
	BLM Las Vegas FO			
	Dispersed, undesignated recreation areas	1,518 (0.08%)	1,123 (0.06%)	1,237 (0.07%)
		57,488 (3.1%)	38,488 (2.1%)	44,147 (2.4%)
	Muddy Mountains SRMA	72 (0.1%)	N/A	N/A
		4,202 (3.4%)		
	Nellis Dunes SRMA	N/A	N/A	0
				142 (1%)
	Dixie National Forest			
	Rural	N/A	N/A	N/A
	Roaded Modified	N/A	N/A	N/A
	Roaded Natural	184 (0.3%)	N/A	N/A
		4,396 (8.0%)		

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Recreation (Continued)	Semi-Primitive Motorized	332 (0.3%)	N/A	N/A
		9,076 (7.8%)		
	SPM Within IRA	*19 (0.02%)*	*N/A*	*N/A*
		3,826 (3.3%)		
	Remainder in SPM ROS	*313 (0.3%)*	*N/A*	*N/A*
		5,250 (4.5%)		
	Semi-primitive Non-Motorized	15 (<0.01%)	N/A	N/A
		10,331 (4.6%)		
	SPNM Within IRA	*5 (<0.01%)*	*N/A*	*N/A*
		9,717 (4.3%)		
	Remainder in SPNM ROS	*10 (<0.01%)*	*N/A*	*N/A*
		614 (0.3%)		
	Private/Other	1 (<0.01%)	N/A	N/A
		20 (<0.01%)		
	Total	531 acres	N/A	N/A
		23,803 acres		
	State Recreation Areas			
	Zane CWMU	N/A	195/5,468 (55%)	195/5,468 (55%)
	Scenic Byways and Backways			
	Rainbow Canyon Backcountry Byway	N/A	2 crossings	1 crossing
			5 miles	5 miles
	Highway 93 Scenic Byway	N/A	N/A	2 crossings
				15 miles
	Bitter Springs Backcountry Byway	1 crossing	N/A	N/A
		2 miles		
	Local Recreation Areas			
	Newcastle Reservoir	0	N/A	N/A
		40 (26%)		

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Recreation (Continued)	Scenic Byways and Backways	None	2 crossings of the Rainbow Canyon Backcountry Byway; 5 miles within the 2-mile corridor.	1 crossing of the Rainbow Canyon Backcountry Byway; 5 miles within the 2-mile corridor.
				1 crossing of the Highway 93 Scenic Byway; 15 miles within the 2-mile corridor.
Land Use and Planning				
(1.a) (6.a)	Federal, State and Tribal lands and Use of Designated Utility Corridors	275 miles total: 81% located on BLM or USFS-managed lands; 5% would be located on state lands. 64% of the route would be within a designated RMP or WWEC (65 miles and 146 miles, respectively).	282 miles total: 75% located on BLM- managed lands; 3% on state lands and 5% be on tribal lands.	309 miles total; 77% located on BLM-managed lands; 3% located on state lands. 64 miles in BLM RMP corridors and 45 miles in WWEC.
			101 miles in BLM RMP corridors and 47 miles in WWEC.	
	Avoidance/Exclusion areas crossed by reference line	None	None	1 mile within avoidance area (Coyote Springs Valley ACEC) and 9 miles within Kane Springs ACEC.
(6.a)	Private Lands and Zoning	38 miles (14%) located on private lands; 9 residences, 7 commercial/industrial structures, one agricultural structure, and 11 outbuildings within 500 feet of the proposed reference line.	48 miles (17%) located on private land. 2 residences, and 6commercial/ industrial structure within 500 feet of reference line. There would be 8 communities and one park and one school within the 2-mile transmission line corridor. There are no identified incompatible designated land uses within the communities.	61 miles (20%) located on private land.
		There would be one community within the 2-mile transmission line corridor; no identified incompatible designated land uses within the community. One cemetery within the 2-mile transmission line corridor.		2 residences, 7 commercial/industrial structures within 500 feet of the reference line.
				There would be 9 communities and 1 park and 1 school within the 2-mile transmission line corridor. There are no identified incompatible designated land uses within the communities.
	Agriculture	No impacts	14 acres of initial clearing, nine acres of construction disturbance, and two acres of permanent removal of croplands.	Four acres of initial clearing, three acres of construction disturbance, and less than one acre of permanent removal of croplands.

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Land Use (Continued)	Livestock Grazing	Construction impacts 9,304 acres (465 AUMs); Operation impacts 966 acres (48 AUMs)	Construction impacts 8,522 acres (426 AUMs); Operation impacts 791 acres (40 AUMs)	Construction impacts 9,438 acres (472 AUMs); Operation impacts 857 acres (43 AUMs)
	USFS land Management	16 miles of ROW within Dixie NF areas specifically managed for roaded natural recreation, big-game winter range, and livestock grazing. A portion would also cross areas without special management prescriptions. Development of a transmission line would generally be compatible with the management prescriptions for these areas; however, timing restrictions would applied within big-game winter range management areas for protection of wildlife resources and temporary roads would be need to reclaimed within one season after intended use.	No impacts	No impacts
(5.f)	Greenfield	73 miles (26%)	140 miles (49%)	96 miles (31%)
Special Designation Areas				
	St. George FO	9 miles of ROW within Beaver Dam Slope ACEC; 25 % of the ACEC (12,347 acres) within the 2-mile corridor, and partially outside of the designated utility corridor. 4,253 acres within ACEC ROW avoidance areas and an additional 2,520 acres in ROW avoidance areas common to both the ACEC and the Beaver Dam Wash NCA. Development of a transmission line or associated roads would not be in conformance with area management outside designated corridors, including a specification of 40 acres of surface disturbance life of project. Impacts to desert tortoise and desert tortoise (and other special status species) habitat during construction from surface disturbance and construction activity.	No impacts	No impacts

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Special Designations (Continued)		4 miles of ROW within Beaver Dam Wash NCA.12% of the NCA (7,571 acres) within the 2-mile corridor, and partially outside of the designated utility corridor; 1,452 acres would be located in NCA-only ROW avoidance areas in addition to shared NCA/ACEC ROW avoidance areas .Impacts to desert tortoise similar to those identified under Beaver Dam Slope ACEC.		
	Caliente FO	10 miles of ROW within Mormon Mesa ACEC; almost all within designated utility corridor.	Impacts to Mormon Mesa ACEC same as Alternative III-A except that 9 miles of ROW within the ACEC.	10 miles of ROW within Kane Springs ACEC; 9.1 miles would be outside of the designated utility corridor. The ACEC is a ROW exclusion area for protection of desert tortoise.
		28 percent of the ACEC (10,615 acres) within 2-mile corridor; 6,555 acres of which in ROW exclusion areas. Development of a transmission line or associated roads would not be in conformance with area management; impacts to desert tortoise R&I values as described above.		28% of the ACEC (6,340 acres) within 2-mile corridor; 5,298 acres in ROW avoidance areas, with corresponding impacts to desert tortoise habitat.
			6% (545 acres) of the Clover Wilderness Area (WA) within 2 -mile corridor. This is a ROW exclusion area; development of roads or use of motorized vehicles would not be compatible with area management; wilderness quality in the areas closest to the 250-foot-wide transmission line ROW could be temporarily reduced during construction from noise and activity.	

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Special Designations (Continued)				2,697 acres of the 2-mile within the Delamar Mountain Wilderness; 346 acres within the Arrow Canyon Wilderness, both of which are ROW exclusion areas. Development of roads or use of motorized vehicles would not be compatible with area management; wilderness quality in the areas closest to the 250-foot-wide transmission line ROW could be temporarily reduced during construction from noise and activity.
	Las Vegas FO	8 miles of ROW within Mormon Mesa ACEC; all within designated utility corridor. 4% of the ACEC (6,550 acres) within 2-mile corridor; 4,555 acres in ROW exclusion areas. Development of a transmission line or associated roads would not be in conformance with area management; impacts to desert tortoise R&I values as described above. One crossing of Muddy River WSR.	Impacts to Mormon Mesa ACEC same as Alternative III-A except 15 miles would cross the Vegas FO ACEC and 8% of ACEC (12,580 acres) within 2-mile corridor, 6,663 acres of which would be within ROW avoidance areas. One crossing of Muddy River and Meadow Valley Wash WSRs.	19 miles of ROW within Coyote Springs Valley ACEC; one mile of which is outside the designated corridor. The ACEC is a ROW avoidance area for protection of desert tortoise. 32% of the ACEC (24,237 acres) within 2-mile corridor; 5,928 acres in ROW avoidance areas, with corresponding impacts to desert tortoise habitat.
(5.e)	Dixie NF	2 miles of ROW within Atchinson IRA. Route partially within a designated WWEC and located on the IRAs' edge leaving most of the IRA unfragmented. Within the IRA, the ROW would be in some areas designated as semi-primitive motorized and non-motorized ROS; use of 100 foot ROW would reduce surface disturbance impacts. Impacts to IRAs during operations from vegetation maintenance within ROW.	No impacts	No impact
(5.e)		The 2-mile transmission line corridor for Alternative III-A would encompass portions of four additional IRAs; TWE would eliminate roads in these areas.		

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Special Designations (Continued)	USFWS Desert National Wildlife Refuge (NWR)	No impacts	No impacts	1 mile of ROW within Desert NWR; almost all within designated utility corridor. 1% of the Refuge (16,524 acres) within 2-mile corridor. Surface disturbance, noise and activity that would impact Refuge values (protection, enhancement, and maintenance of desert bighorn sheep) in this area. 170 acres of the Pahranagat NWR also would be within 2-mile corridor. Road construction in this area would remove habitat for migratory birds.
(5.d)	NHTs	3 segments of the Old Spanish NHT crossed; 1 NHT-1, 2 unrated. Visible along 10 miles of the trail ,of which - 8 miles are NHT-I, 1.9 miles are NHT-II, and 0.1 mile of NHT-IV.	No segments of the Old Spanish NHT crossed. Visible along 6.2 miles of the trail, of which 5 miles are NHT-I, 1 mile are NHT-II, and 0.1 mile is NHT-IV.	No Impacts
Transportation				
	Total Miles of New Permanent Access Roads	423	401	433
	Total Miles of Steep and Mountainous Terrain	185	79	99
	Road Crossings	12	8	10
	Railroad Crossings	4	10	11
	Center Line Passing Through Public Land (miles)	237	234	247
	Center Line Passing Through Private Land (miles)	38	48	61
	Number of Airports within 5 miles	1	2	2
	MOAs within 20 Miles	4	4	4
		Hill AFB Sevier MOA; Wendover MOA	Hill AFB Sevier (MOA); Wendover MOA	Hill AFB Sevier MOA; Wendover MOA
		Nellis AFB Desert MOA; Nellis Desert MOA	Nellis AFB Desert MOA; Nellis Desert MOA	Nellis AFB Desert MOA; Nellis Desert MOA

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Transportation (Continued)	MOAs with 250-foot-Wide Transmission ROW Overlap	Hill AFB Sevier B MOA	Hill AFB Sevier B MOA	Hill AFB Sevier B MOA
		(Most Overlap)	(Conflict)	(Conflict)
			Nellis AFB Desert MOA	Nellis AFB Desert MOA
			(Conflict)	(Most Conflict)
Socioeconomics				
	Short-term Socioeconomic effects	Temporary employment, population and tax effects similar to those for Alternative II-A.	Essentially the same as those in Alternative III-A.	Similar to, but up to 10% higher than those in Alt. III-A.
		Effects distributed between Utah and Nevada.	Distribution of effects more focused in Nevada than under Alt. III-A.	Distribution of effects more focused in Nevada than under Alt. III-A.
		Substantial tax revenues, but magnitude will reflect lack of a terminal in Region III.	Essentially the same as those in Alternative III-A.	Similar to, but up to 10% higher than those in Alt. III-A.
		Temporary housing availability limited in western Utah.	Temporary housing availability limited in western Utah and outlying areas of Nevada.	Temporary housing availability limited in western Utah and outlying areas of Nevada.
	Long-term socioeconomic effects	Long-term economic effects similar to those for Alternative I-A.	Generally the same as, but slightly higher tax revenues than Alternative III-A.	Generally the same as, but slightly higher tax revenues than Alternative III-A.
		Project generates ad valorem/property taxes on improvements in the region. A terminal is not planned under III-A, but could be under design options	Distribution of fiscal benefits more focused in Nevada than under Alt. III-A.	Distribution of fiscal benefits more focused in Nevada than under Alt. III-A.
		Most of this corridor passes through undeveloped rural area, therefor limited potential for adverse effects to property value, on social values or outdoor recreation. Relatively higher, but still limited potential for effects to outdoor recreation on Dixie NF.	Similar to effects from Alternative III-A, but avoids the Dixie NF.	Similar to effects from Alternative III-A, but avoids the Dixie NF.
		Federal government and other lessors receive rental/ lease income on ROW.	Same as Alternative III-A	Same as Alternative III-A
		Project development and operations would not result in effects warranting further consideration under Environmental Justice.	A segment of this alternative passes through the Moapa Reservation, in an area with substantial industrial development in place. Location would require agreement with the Moapa Tribe. No further consideration warranted under Environmental Justice.	Same as Alternative III-A

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Health and Safety				
	Serious injuries to workers and the public at-large	Workers during construction and operation may be injured by heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical hazards found on a construction site. The workers and the public may be injured by fire as well as downed power lines.	Same as Alternative III-A	Same as Alternative III-A
	Adverse health impacts from EMF, stray voltage, and induced voltage associated with transmission lines	Four outbuildings, three commercial/industrial structures, and two residential structures would be within 200 feet of the reference line, resulting in potential impacts from EMF, stray voltage, and induced voltage.	Four outbuildings, three commercial/industrial structures, and one residential structure would be within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be slightly less than Alternative III-A.	Four outbuildings, four commercial/industrial structures, and one residential structure would be within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be similar to slightly less than Alternative III-A.
(4.a) (4.b)	Noise impacts to nearby communities and residences	There would be two communities within the 2-mile transmission line corridor; seven residential structures within 500 feet of the reference line, and two residential structures within 200 feet of the reference line, resulting in potential impacts from noise with this alternative.	There would be eight communities within the 2-mile transmission line corridor; two residential structures within 500 feet of the reference line, and one residential structure 200 feet of the reference line, resulting in impacts from noise that would be greater than Alternative III-A.	There would be nine communities within the 2-mile transmission line corridor; two residential structures within 500 feet of the reference line, and one residential structure within 200 feet of the reference line, resulting in impacts from noise that would be greater than Alternative III-A.
Wild Horses				
	Temporary and permanent loss of forage areas	69 acres of 250-foot-wide ROW within the Chloride Canyon HMA (<0.03% of the HMA). 100 acres of temporary disturbance, 24 acres permanent.	No acres of 250-foot-wide ROW within the Eagle HMA. Less than 1 acre of temporary permanent/ disturbance. No acres of 250-foot-wide ROW within the North Hills HMA. 11 acres of temporary disturbance, 3 acre permanent.	Same as Alternative II-B.
	Temporary construction noise and human activity	2.909 acres of 2-mile transmission line corridor within the Chloride Canyon HMA (1.4% of HMA).	56 acres of 2-mile transmission line corridor within the Eagle HMA (0.01% of HMA). 2,795 acres of 2-mile transmission line corridor within the North Hills HMA (5.6% of HMA).	Same as Alternative II-B.
	Presence of transmission line within HMAs / HAs restrict helicopter use during wild horse gathers	2 miles of transmission line within the Chloride Canyon HMA.	No miles of transmission line within the Eagle or North Hills HMA.	Same as Alternative II-B.

Table 2-25 Summary of Impacts for Region III

Resource	Resource Topic	Alternative III-A	Alternative III-B	Alternative III-C
Lands with Wilderness Characteristics				
(5.e)	Number of LWC Units Affected	2	6	9
(5.e)	Number (acres) of LWC Units Eliminated	0	1 (9,108)	0
(5.e)	Number (acres) of LWC Units Remaining	3 (54,147)	7 (187,931)	12 (237,291)
(5.e)	Number (acres) of Unit Portions Eliminated	2 (510)	13 (4,518)	12 (3,364)
Plan Amendments				
(2.a)	Location, length, and reason for plan amendment	None	None	CFO (9 miles)—ROW exclusion area exception

[1] Number includes nest for which the species is not known.

[2] Number does not include MIS that are classified as special status.

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Region IV				
Climate and Air				
	Fugitive Dust Emissions (PM_{10})	44.4 tons	47.2 tons	49.4 tons
Geology				
	Geologic Hazards Risk	Near active Black Hills fault, ground motion potential, low landslide, low subsidence.	Same as Alternative IV-A	Same as Alternative IV-A
	Mineral Resource Access	No oil and gas or coal mining. No potential mineral conflicts.	No oil and gas or coal mining. Potential conflicts with gypsum mining.	
	Paleontological Resources Loss	0 miles PFYC Class 5.	0 miles PFYC Class 5.	0 miles PFYC Class 5.
Soils				
	Soils – Wind Erodible	`	66 acres	109 acres
	Soils – Water Erodible	16 acres	1 acre	1 acre
	Soils-Compaction Prone	0 acres	3 acres	2 acres
	Soils-LRP	191 acres	191 acres	166 acres
	Soils- Prime Farmland	0 acres	0 acres	0 acres
Water				
	Erosion and Sedimentation Direct Effects from Crossings	One perennial stream crossings	Three perennial stream crossings	Two perennial stream crossings
	Impaired Stream Effects from Crossings	One impaired stream crossed	One impaired stream crossed	One impaired stream crossed
	Effects to Water Users from Construction Water Use	28 acre-feet required	29 acre-feet required	33 acre-feet required
	Maximum Road Density Change in Watershed (HUC10, 300-foot, or 100-foot perennial buffer area)	0.16 mile/mile^2 (100 feet: Duck Creek-Las Vegas Wash Watershed)	0.18 mile/mile^2 (Government Wash-Colorado River Watershed)	0.18 mile/mile^2 (Government Wash-Colorado River Watershed)
Vegetation				
	Vegetation clearing of woody vegetation over 6 feet in height	<1 acre of the woody riparian and wetlands	7 acres of the woody riparian and wetlands	7 acres of the woody riparian and wetlands
	Wetlands and Riparian Areas impacted by Facilities Construction (acres)	5 acres of riparian, and < 1 acre of woody riparian and wetlands	1 acre of herbaceous wetlands, 1 acre of riparian, and 5 acres of woody riparian and wetlands	1 acre of herbaceous wetlands, 1 acre of riparian, and 5 acres of woody riparian and wetlands
	Wetlands and Riparian Areas impacted by Operations (acres)	<1 acre of herbaceous wetlands and 1 acre of riparian	<1 acre of herbaceous wetlands, <1 acre of riparian, and 2 acres of woody riparian and wetlands	< 1 acre each of herbaceous wetlands and riparian and 2 acres of woody riparian and wetlands
	USFS MIS Species	NA	NA	NA

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Special Status Plants				
	Number of USFWS species with known occurrences impacted	0	0	0
	Number of USFWS species with potential habitat impacted	1	1	1
	Number of BLM Sensitive species with known occurrences impacted	4	3	2
	Number of BLM Sensitive species with potential habitat impacted	19	18	16
	Number of USFS Sensitive species with known occurrences impacted	0	0	0
	Number of USFS Sensitive species with potential habitat impacted	0	0	0
	Number of Lake Mead NRA Sensitive species with known occurrences impacted	0	2	2
	Number of Lake Mead NRA Sensitive species with potential habitat impacted	0	2	2
	Number of Nevada state listed species with known occurrences impacted	1	1	1
	Number of Nevada state listed species with potential habitat impacted	5	5	5
Wildlife				
(5.a)	Desert bighorn sheep occupied range – Nevada (acres)	122/39	69/31	39/19
	Small game, nongame habitat (acres) construction/operation	900/98	897/121	924/122
	Waterfowl habitat (acres) construction/operation	13/1	21/7	Same as Alternative IV-B
(5.b)	Number of raptor nests within 1 mile of the reference line	0	0	0
	IBAs crossed by the 2-mile transmission line corridor (acres)	0	Lake Mead NRA (643 acres)	Lake Mead NRA (643 acres)

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
SSS Wildlife				
(3.d)	Impacted desert tortoise potential habitat (acres) construction/operation	566/148	553/171	645/172
	Impacted Yuma clapper rail habitat (acres) construction/operation	1/<1	12/2	Same as Alternative IV-B
	Impacted western yellow-billed cuckoo habitat (acres) construction/operation	1/<1	12/2	Same as Alternative IV-B
	Impacted southwestern willow flycatcher habitat (acres) construction/operation	1/<1	12/2	Same as Alternative IV-B
(3.b)	Number of special status raptor nests within 1 mile of the reference line	1	1	1
Aquatic Biological Resources				
	Effects on aquatic habitat and species from potential direct and indirect disturbance or water quality changes	1 perennial streams crossed by 250-foot-wide ROW; 1 game fish stream crossed by 250-foot-wide ROW	4 perennial streams crossed by 250-foot ROW; 1 game fish stream crossed by 250-foot-wide ROW	3 perennial streams crossed by 250-foot ROW; 1 game fish stream crossed by 250-foot-wide ROW
	Potential aquatic habitat alteration or loss (feet^2)	400	1,600	1,200
	Potential amphibian mortalities from vehicle traffic	39 ROW miles	41 ROW miles	43 ROW miles
Special Status Aquatic Resources				
	Effects on habitat and special status species from direct disturbance or water quality changes	1 perennial streams with special status aquatic species crossed by 250-foot ROW	No perennial streams with special status aquatic species crossed by 250-foot ROW	No perennial streams with special status aquatic species crossed by 250-foot ROW
		1 stream with federally listed or petitioned aquatic species	1 stream with federally listed or petitioned aquatic species	1 stream with federally listed or petitioned aquatic species
	Number of special status aquatic species with potential habitat alteration or loss	0	0	0
	Number of watersheds supporting special status aquatic species with increased road densities	1	0	0
	Potential direct disturbance on critical habitat for federally listed species	None	None	None

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Cultural Resources				
	NRHP-listed Sites	2	0	0
	NRHP-Eligible Sites	6	12	17
	Unevaluated Sites	4	6	7
	Potential TCPs	8	7	7
	Trail Crossings	Old Spanish Trail (0)	Old Spanish Trail (0)	Old Spanish Trail (0)
	Average Inventory Coverage	39%	34%	32%
	Site Density (sites per 100 acres inventoried)	0.007	0.005	0.005
	Overall Trail Visibility (within 5-mile viewshed)	0 miles	0 miles	0 miles
Visual Resources				
	High Sensitivity Viewers			
	0–0.5 miles	25	17	14
	0.5–2.5 miles	8	15	17
	2.5–5 miles	7	7	9
	>5 miles	--	--	5
	Moderate Sensitivity Viewers			
	0–0.5 miles	7	20	16
	0.5–2.5 miles	23	17	26
	2.5–5 miles	8	2	3
	>5 miles	--	--	--
	Scenic Quality (miles)			
	A	3	7	8
	B	17	2	2
	C	17	30	35
	BLM VRI Classifications (miles)			
	Class II	14	2	2
	Class III	8	6	6
	Class IV	4	--	--

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Visual	BLM VRM Classifications (miles)			
Resources	Class II	--	--	--
(Continued)	Class III	22	8	8
	Class IV	3	--	--
	USFS SIO/VQO Classifications (miles)			
	High Retention	--	--	--
	Moderate Partial Retention	--	--	--
	Low Modification	--	--	--
	Residual Impacts Landscape Scenery (miles)			
	High	6	6	6
(5.c)	Moderate	3	9	10
	Low	29	24	29
	Residual Impacts High Sensitivity Viewers (miles)			
	High	6	8	8
(5.c)	Moderate	17	13	10
	Low	15	18	27
	Residual Impacts Moderate Sensitivity Viewers (miles)			
	High	--	7	7
	Moderate	12	18	14
	Low	25	14	24
	BLM VRM USFS SIO/VQO Compliance/Consistency (miles) Before Mitigation			
	Compliant	20	8	8
	Non-compliant	5	--	--
	NA	12	31	37
	BLM VRM USFS SIO/VQO Compliance/Consistency (Miles) After Mitigation			
	Compliant	20	8	8
	Non-compliant	5	--	--
	NA	12	31	37

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Recreation				
	Recreation Area/Site in Region IV	250-foot-wide ROW Acres (% of Total Area)	250-foot-wide ROW Acres (% of Total Area)	250-foot-wide ROW Acres (% of Total Area)
		2-mile Corridor Acres (% of Total Area)	2-mile Corridor Acres (% of Total Area)	2-mile Corridor Acres (% of Total Area)
	BLM Las Vegas FO			
	Dispersed, undesignated recreation areas	213 (0.01%)	190 (0.01%)	190 (0.01%)
		6,990 (0.4%)	6,765 (0.4%)	6,765 (0.4%)
	Nellis Dunes SRMA	0	0	0
		183 (1.2%)	183 (1.2%)	183 (1.2%)
	Sunrise Mountain SRMA	330 (0.9%)	43 (0.1%)	43 (0.1%)
		11,155 (29.7%)	1,825 (4.9%)	1,825 (4.9%)
	Las Vegas Valley SRMA	296 (0.2%)	12 (<0.01%)	N/A
		8,209 (4.2%)	535 (0.3%)	
	Nelson/Eldorado SRMA	151 (0.2%)	107 (0.1%)	0
		7,871 (8.6%)	3,498 (3.8%)	29 (<0.1%)
	Other Federally Managed Recreation Areas			
	Sloan Canyon NCA	0	NA	N/A
		2,684 (6.0%)		
	Lake Mead NRA (NPS)	0	427 (0.03%)	414 (0.03%)
		25 (<0.01%)	12,871 (<1%)	14,482 (<1%)
	Local Recreation Areas			
	Clark County Wetlands Park	18 (0.6%)	N/A	N/A
		376 (13%)		
	Cascata Golf Course	N/A	0	N/A
			229 (53%)	
	Bootleg Canyon	N/A	66 (2.9%)	N/A
			1,627 (70%)	
	River Mountains Loop Trail	4 crossings	8 crossings	6 crossings
		8 miles	11 miles	11 miles

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Land Use and Planning				
(1.a) (6.a)	Federal, State and Tribal lands and Use of Designated Utility Corridors	39 miles total: 81% located on federally managed lands.	41 miles total: 56% located on federally managed lands.	43 miles total: 55% located on federally managed lands.
		6 miles of BLM RMP corridors and 16 miles of designated WWEC.	5 miles in BLM RMP corridors and 6 miles in WWEC.	5 miles in BLM RMP corridors and 6 miles in WWEC.
	Avoidance/Exclusion areas crossed by reference line	11 miles designated avoidance areas in the Rainbow Gardens and River Mountains ACEC. 1 mile in the Sunrise Mountain ISA exclusion area.	2 miles avoidance areas in the Rainbow Gardens ACEC; no exclusion areas.	2 miles avoidance areas in the Rainbow Gardens ACEC; no exclusion areas.
(6.a)	Private Lands and Zoning	8 miles (19 %) located on private land. 11 residential structures and 3 commercial/ industrial structures within 500 feet of the proposed reference line. Two communities within the 2-mile transmission line corridor.	18 miles (44%) would be located on private land. 9 residential structures and 2 commercial/industrial structures within 500 feet of reference line. One community within the 2-mile transmission line corridor.	19 miles (45%) would be located on private land. 9 residential structures and 1 commercial/industrial structures within 500 feet of the proposed reference line. There would be 1 community within the 2-mile transmission line corridor.
	Agriculture	None	None	None
	Livestock Grazing	None	None	None
(5.f)	Greenfield	0 miles (0%)	12 miles (31%)	12 miles (27%)
Special Designation Areas				
	Las Vegas FO	250-foot ROW would cross one ISA and 2 ACECs.	250-foot ROW would cross one ACEC; 2 mile corridor would encompass portions of one ISA and 2 ACECs. Impacts to Lake Mead NRA discussed under Recreation.	250-foot ROW would cross one ACEC; 2 mile corridor would encompass portions of one WA, one ISA, one ACEC and NRA.
		One mile of the 250-foot-wide transmission line ROW would fall within the Sunrise Mountain ISA but outside of the designated utility corridor.	3 miles of the ROW within Rainbow Gardens ACEC and 6.9% of ACEC (2,590 acre) within 2-mile corridor. Impacts similar to Alternative IV-A.	Impacts to Rainbow Garden ACEC same as under Alternative IV-B.

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Special Designation Areas (Continued)		This is not compatible with special designation area (SDA) management, as the ISA is a ROW exclusion area. The BLM has recommended the release of the IRA from wilderness consideration primarily because of a lack of wilderness character. Therefore, construction of the TWE power line is not likely to appreciably change the wilderness character of the ISA.		
			5.2% the Sunrise Mountain ISA (532 acres) within 2-mile corridor; impacts similar to Alternative IV-A.	5.8 percent of the Black Mountain WA (1,005 acres) within 2-mile corridor. Development of road or use of motorized vehicles would not be compatible with area management and wilderness quality in the areas closest to the 250-foot-wide transmission line ROW could be temporarily reduced during construction from noise and activity.
		11 miles of ROW within the Rainbow Gardens ACEC, 9 miles of which would be outside of designated corridors and within ROW avoidance area. 28 % of the ACEC (10,563 acres) within 2-mile corridor, with corresponding impacts to geological, scenic, cultural, or sensitive plant R&I values from construction and operation.		
			73 acres of the 2-mile transmission line corridor would be located within River Mountain ACEC, with corresponding impacts as discussed under Alternative IV-A.	'Impacts to Sunrise Mountain ISA same as under Alternative IV-B.

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Special Designation Areas (Continued)		5 miles of ROW within the River Mountain ACEC, fully within designated utility corridor. 56% of the ACEC (3,127 acres) within 2-mile transmission line corridor and ROW avoidance area, with corresponding impacts to bighorn sheep habitat and scenic viewshed R&I values.	14 miles of ROW within Lake Mead NRA; 427 acres within 2-mile transmission line corridor. NPS has indicated that construction and operation of this alternative is incompatible with NRA management.	14 miles of ROW within Lake Mead NRA; 414 acres within 2-mile transmission line corridor. NPS has indicated that construction and operation of this alternative is incompatible with NRA management.
Transportation				
	Total Miles of New Permanent Access Roads	63	73	73
	Total Miles of Steep and Mountainous Terrain	25	37	32
	Road Crossings	5	7	6
	Railroad Crossings	2	2	1
	Center Line Passing Through Public Land (miles)	32	23	24
	Center Line Passing Through Private Land (miles)	8	18	19
	Number of Airports within 5 Miles	4	2	2
	MOAs within 20 Miles	Nellis AFB	Nellis AFB	Nellis AFB
	MOAs with 250-foot-Wide Transmission ROW Overlap	0	0	0
Socioeconomics				
	Short-term socioeconomic effects	Temporary economic effects, i.e., construction jobs and sales and use tax revenues, would be similar to those for Alternative I-A, but concentrated in the Las Vegas Valley and with little temporary worker or population influx.	Essentially the same as those in Alternative IV-A.	Essentially the same as those in Alternative IV-A.
		Tax revenues generated would reflect the additional capital investment associated with a terminal in Region IV.	Essentially the same as those in Alternative IV-A.	Essentially the same as those in Alternative IV-A.
		Adequate temporary housing available to meet demands.	Essentially the same as those in Alternative IV-A.	Essentially the same as those in Alternative IV-A.
	Long-term socioeconomic effects	Long-term economic effects similar to those for Alternative I-A.	Essentially the same as those in Alternative IV-A.	Essentially the same as those in Alternative IV-A.
		Negligible, if any, effect on livestock grazing and agricultural production.	Same as Alternative IV-A	Same as Alternative IV-A

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Socioeconomics (Continued)		Project generates ad valorem/property taxes on improvements in the region. Tax revenues boosted by location of the southern terminal in this region. Location of terminal could be altered under design options.	Same as Alternative IV-A	Same as Alternative IV-A
		Limited effects on outdoor recreation due to location in developed metropolitan area. Potential minor effects due to location in urbanized area, including near existing and future residential development.	Higher potential for dissatisfaction and conflict with outdoor recreation due to location within Lake Mead NRA, but lower potential effects on property values because more removed from residential and commercial development.	Higher potential for dissatisfaction and conflict with outdoor recreation due to location within Lake Mead NRA, but lower potential effects on property values because more removed from residential and commercial development.
		Federal government receives rental/ lease income on ROW.	Essentially the same as Alternative IV-A.	Essentially the same as Alternative IV-A.
		Project development and operations would not result in effects warranting detailed consideration under Environmental Justice.	Same as Alternative IV-A	Same as Alternative IV-A
Health and Safety				
	Serious injuries to workers and the public at-large	Workers during construction and operation may be injured by heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical hazards found on a construction site. The workers and the public may be injured by fire as well as downed power lines.	Same as Alternative IV-A.	Same as Alternative IV-A.
	Adverse health impacts from EMF, stray voltage, and induced voltage associated with transmission lines	Two commercial/industrial structures would be within 200 feet of the reference line, resulting in potential impacts from EMF, stray voltage, and induced voltage.	There would be no structures within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be less than Alternative IV-A.	There would be no structures within 200 feet of the reference line, resulting in the potential for impacts from EMF, stray voltage, and induced current that would be less than Alternative IV-A.

Table 2-26 Summary of Impacts for Region IV

Resource	Resource Topic	Alternative IV-A	Alternative IV-B	Alternative IV-C
Health and Safety (Continued) (4.a) (4.b)	Noise impacts to nearby communities and residences	There would be two communities within the 2-mile transmission line corridor; 11 residential structures within 500 feet of the reference line, and no residential structures within 200 feet of the reference line, resulting in potential impacts from noise with this alternative.	There would be one community within the 2-mile transmission line corridor; nine residential structures within 500 feet of the reference line, and no residential structure 200 feet of the reference line, resulting in impacts from noise that would be slightly less than Alternative IV-A.	There would be one community within the 2-mile transmission line corridor; nine residential structures within 500 feet of the reference line, and no residential structure 200 feet of the reference line, resulting in impacts from noise that would be slightly less than Alternative IV-A.
	Impacts from associated accidental release of hazardous materials.			
Wild Horses				
	Impacts to HMAs or HAs.	No wild horse HMAs and HAs in Region IV.	No wild horse HMAs and HAs in Region IV.	No wild horse HMAs and HAs in Region IV.
Lands with Wilderness Characteristics				
(5.e)	LWC	No LWC units affected in Region IV.	No LWC units affected in Region IV.	No LWC units affected in Region IV.
Plan Amendments				
(2.a)	Location, length, and reason for plan amendment	LVFO (1 mile)—ISA corridor exception	None	None

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Climate and Air				
	Fugitive Dust Emissions	(PM_{10})	489 tons	503 tons
Geology				
	Geologic Hazards Risk		Six active faults crossed. Moderate risk for ground motion. Moderate to high risk for landslide impacts. Low to moderate risk for ground subsidence.	Four active faults crossed. Moderate risk for ground motion. Moderate to high risk for landslide impacts. Increased risk for subsidence due to historic coal mining.
	Mineral Resource Access		Thirteen oil and gas fields crossed. Encroaches on propose coal mine permit area, Deserado Mine. Potential conflict with active mining areas near Milford, Utah.	Fourteen oil and gas fields crossed. Encroaches on proposed coal mine permit area, Deserado Mine. Potential conflict with active mining areas near Milford, Utah.
	Paleontological Resources Loss	(miles of PFYC 5)	216	157
Soils				
	Wind Erodible	(acres)	593	589
	Water Erodible	(acres)	546	578
	Compaction Prone	(acres)	2,657	3,173
	Limited Revegetation Potential	(acres)	3,610	3,804
	Prime Farmland	(acres)	608	427
Water				
	Erosion and Sedimentation Direct Effects from Crossings	(perennial stream crossings)	25	37
	Impaired Stream Effects from Crossings	(impaired streams crossed)	9	4
	Effects to Water Users from Construction Water Use	(acre-feet)	542	567
	Maximum Road Density Change in Watershed	(mi/mi2 in HUC10, 300-foot or 100-foot perennial buffer area)	1.61 (100 feet: The Big Wash-Beaver River Watershed)	1.61 (100 feet: The Big Wash-Beaver River Watershed)

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Vegetation				
	ROW Clearing-woody vegetation >6 feet height	aspen forest and woodland (acres)	165	162
		conifer forest (acres)	69	192
		deciduous forest (acres)	29	4
		pinyon-juniper (acres)	1,051	1,241
		woody riparian and wetlands (acres)	93	92
	Wetlands and Riparian Areas - Construction	greasewood flat (acres)	362	481
		herbaceous wetland (acres)	81	100
		riparian (acres)	46	55
		woody riparian and wetlands (acres)	63	59
	Wetlands and Riparian Areas - Operation	greasewood flat (acres)	90	114
		herbaceous wetland (acres)	18	19
		riparian (acres)	14	12
		woody riparian and wetlands (acres)	18	16
		USFS MIS Species	Alternative does not cross USFS Fishlake National Forest	Based on elevation, there is no potential habitat for this species within the USFS Fishlake National Forest.
Special Status Plant				
	USFWS species -known occurrence	(count)	3	6
	USFWS species -potential habitat	(count)	11	12
	BLM sensitive species -known occurrence	(count)	22	26

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Special Status Plant (Continued)	BLM sensitive species -potential habitat	(count)	101	113
	USFS sensitive species -known occurrence	(count)	1	2
	USFS sensitive species -potential habitat	(count)	5	9
	Lake Mead NRA Sensitive species -known occurrence	(count)	0	0
	Lake Mead NRA Sensitive species -potential habitat	(count)	0	0
	Nevada state listed species - known occurrence	(count)	4	4
	Nevada state listed species - potential habitat	(count)	9	11
Wildlife				
(5.a)	Pronghorn crucial winter range	construction (acres)	2,650	3,384
		operation (acres)	677	819
	Mule deer crucial winter range	construction (acres)	1,545	1,253
		operation (acres)	963	381
	Elk crucial winter range	construction (acres)	1,411	1,338
		operation (acres)	491	674
	Moose occupied habitat	construction (acres)	222	710
		operation (acres)	72	255
	Rocky Mountain or desert bighorn sheep	construction (acres)	106	140
		operation (acres)	39	81
	Small game, nongame habitat	construction (acres)	23,092	24,315
		operation (acres)	2,601	2,705

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Wildlife (Continued) (5.b)	Waterfowl habitat	construction (acres)	490	534
		operation (acres)	52	50
	Number of raptor nests within 1 mile of the reference line	(count)	413	340
	IBAs crossed by the 2-mile transmission line corridor	(count)	Powder Rim (9,708 acres); Upper Strawberry Watershed (UT12) (1,399 acres)	Powder Rim (11,988 acres); Muddy Creek Wetlands (3,131 acres)
	Number of MIS species whose habitat is crossed by alternative	(count)	3	12
Special Status Wildlife				
(3.a)	Impacted greater sage-grouse habitat	construction (acres)	4,044	2,423
		operation (acres)	1,100	639
(3.a)	Occupied greater sage-grouse leks within 4 miles of reference line	construction (acres)	49	62
		operation (acres)	0	0
	Impacted potential black-footed ferret habitat	construction (acres)	368	381
		operation (acres)	95	97
	Impacted western yellow-billed cuckoo potential habitat	construction (acres)	156	153
		operation (acres)	19	16
	Impacted Canada lynx potential habitat	construction (acres)	120	418
		operation (acres)	20	91
	Impacted Utah prairie dog potential habitat	construction (acres)	77	86
		operation (acres)	31	36
	Impacted California condor potential habitat	construction (acres)	4,810	4,308
		operation (acres)	525	401
	Impacted Yuma clapper rail potential habitat	construction (acres)	23	82
		operation (acres)	3	6

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Special Status Wildlife (Continued) (3.b)	Impacted southwestern willow flycatcher potential habitat	construction (acres)	23	82
		operation (acres)	3	6
	Special status raptor nests within 1 mile of the reference line	(count)	525	528
	Impacted desert tortoise potential habitat	construction (acres)	1,559	1,647
		operation (acres)	447	427
Aquatic Biological Resources				
	Effects on aquatic habitat and species from potential direct and indirect disturbance or water quality changes	perennial streams crossed by 250-foot-ROW	33	36
		game fish streams crossed by 250-foot-ROW	17	17
	Potential aquatic habitat alteration or loss	(feet^2)	12,000	8,800
	Potential for amphibian mortalities from vehicle traffic	(miles)	726	759
Special Status Aquatic Resources				
	Effects on habitat and special status species from potential direct disturbance or water quality changes	SSAS streams crossed by 250-foot-ROW	19	17
		Federally listed or petitioned aquatic species streams crossed	5	6
	Special status aquatic species with potential habitat alteration or loss	(count)	21	9
	Watersheds supporting special status aquatic species with increased road densities	(count)	17	16
	Potential direct disturbance on critical habitat for federally listed species	(acres)	5	8

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Cultural Resources				
	NRHP-listed Sites	(count)	2	3
	NRHP-eligible Sites	(count)	61	60
	Unevaluated Sites	(count)	24	32
	Potential TCPs	(count)	12	24
	Average Inventory Coverage	(percent)	23%	30%
	Site Density (sites per 100 acres inventoried)		0.79	1.62
	Overall Trail/Road Visibility within 5-mile viewshed	(miles)	115	107
Visual Resources				
(5.c)	Residual Impacts Landscape Scenery	High (miles)	221	251
		Moderate (miles)	194	233
		Low (miles)	310	276
	Residual Impacts High Sensitivity Viewers	High (miles)	97	101
		Moderate (miles)	300	376
		Low (miles)	328	284
	Residual Impacts Moderate Sensitivity Viewers	High (miles)	88	127
		Moderate (miles)	216	222
		Low (miles)	421	411
	BLM VRM USFS SIO/VQO Compliance/Consistency-After Mitigation	Compliant (miles)	467	478
		Non-compliant (miles)	19	28
		N/A (miles)	239	153

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Recreation				
	State/Federal Parks crossed by 2-mile corridor	(count)	4	4
	SRMAs crossed by 2-mile corridor	(count)	7	7
	Dispersed, undesignated within 2-mile corridor	(acres)	430,908	468,404
Land Use and Planning				
(6.a)	Land Jurisdiction	Federal (percent)	68	68
		State (percent)	6	8
		Tribal (percent)	0	2
		Private (percent)	25	23
(1.a)	Use of Designated Utility Corridors	(miles of BLM/USFS)	103	144
		(miles of WWEC)	227	126
(5.f)	Greenfield	(percent)	27	49
Special Designation Areas				
(5.d)	National Historic and Scenic Trails	CDNST	1 segment crossed. 4 acres within the 250-foot ROW and 179 acres with the 2-mile corridor. Impacts to the trail itself would be minimized by the placement of the transmission line ROW within a designated overhead utility corridor; towers would be placed to avoid surface disturbance near the actual trail.	1 segment crossed. 4 acres within the 250-foot ROW and 179 acres with the 2-mile corridor. Impacts to the trail itself would be minimized by the placement of the transmission line ROW within a designated overhead utility corridor; towers would be placed to avoid surface disturbance near the actual trail.
		Overland Trail NHT	1 contributing segment crossed. Visible along 9 miles of trail, 5 of which are contributing.	1 contributing segment crossed. Visible along 9 miles of trail, 4 of which are contributing.
		Cherokee Trail NHT	1 contributing segment crossed. Visible along 24 miles of trail, 10 of which are contributing.	1 contributing segment crossed. Visible along 28 miles of trail, 10 of which are contributing

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Special Designation Areas (Continued)		Old Spanish Trail NHT	3 segments of the Old Spanish NHT crossed; 1 NHT-1, 2 unrated. Visible along 10 miles of the trail ,of which - 8 miles are NHT-I, 1.9 miles are NHT-II, and 0.1 mile of NHT-IV.	No segments of the Old Spanish NHT crossed. Visible along 6.2 miles of the trail, of which 5 miles are NHT-I, 1 mile are NHT-II, and 0.1 mile is NHT-IV.
	WSR-suitable river reach	(count)	1	3
	ACEC within 2-mile corridor	(count)	4	6
		(acres)	27,018	23,534
	IRA within 2-mile corridor	(count)	16	14
		(acres)	29,502	11,775
Transportation				
	Total Miles of New Permanent Access Roads	(miles)	950	978
	Total Miles of Steep and Mountainous Terrain	(miles)	515	458
	Road Crossings	(count)	42	33
	Railroad Crossings	(count)	10	23
	Reference Line Passing Through Public Land (miles)	(miles)	534	581
	Reference Line Passing Through Private Land (miles)	(miles)	193	184
	Number of Airports within 5 Miles	(count)	13	11
	Military Operations Areas (MOAs) within 20 Miles	(count)	2	2
	MOAs crossed by 250-foot-wide Transmission ROW		Hill AFB Sevier B MOA	Hill AFB Sevier B MOA; Nellis AFB

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Socioeconomics				
	Short-term Socioeconomic effects		Temporary increases in local employment, demand on temporary housing, and public facilities and services. Temporary effects similar in nature to those associated with transmission line construction for Alternative I-A; mostly transient as construction progresses along the corridor. No effects related to terminal construction, unlike for Alternative I-A. Alternative III-A Temporary economic effects, i.e., construction jobs and sales and use tax revenues, would be similar to those for Alternative I-A, but concentrated in the Las Vegas Valley and with little temporary worker or population influx.	Temporary increases in local employment, demand on temporary housing, and public facilities and services. Temporary effects similar in nature to those associated with transmission line construction for Alternative I-A; mostly transient as construction progresses along the corridor. No effects related to terminal construction, unlike for Alternative I-A. Alternative III-B Temporary economic effects, i.e., construction jobs and sales and use tax revenues, would be similar to those for Alternative I-A, but concentrated in the Las Vegas Valley and with little temporary worker or population influx.
	Long-term socioeconomic effects		Little long-term effects on employment, population, housing need or public services.	Little long-term effects on employment, population, housing need or public services.
			Substantial ad valorem taxes paid; primarily to counties and other taxing jurisdictions.	Substantial ad valorem taxes paid; primarily to counties and other taxing jurisdictions.
			Limited effects on property values, social values, and limited conflicts with outdoor recreation. Limited private land and existing energy resource development in proximity to much of the ROW.	Limited effects on property values, social values, and limited conflicts with outdoor recreation. Limited private land and existing energy resource development in proximity to much of the ROW.
			Federal government and other lessors gain ROW rental/lease income.	Federal government and other lessors gain ROW rental/lease income.

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Health and Safety				
	Serious injuries to workers and the public at-large		Workers during construction and operation may be injured by heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical hazards found on a construction site. The workers and the public may be injured by fire as well as downed power lines.	Workers during construction and operation may be injured by heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical hazards found on a construction site. The workers and the public may be injured by fire as well as downed power lines.
	Adverse health impacts from EMF, stray voltage, and induced voltage associated with transmission lines (Structures within 500 feet)	Residential	71	26
		Commercial/Industrial	86	48
		Agricultural	1	0
		Outbuilding	24	18
(4.b)	Noise impacts to nearby communities and residences	Communities within 2-mile corridor	13	20
Wild Horses				
	Presence of transmission line within HMAs	(miles)	23	1
Lands with Wilderness Characteristics				
(5.e)	LWC Units Affected	(count)	11	18
	LWC Units Eliminated	(count)	0	2
		(acres)	0	15,451
	LWC Units Remaining	(count)	13	19
		(acres)	140,047	464,753
	Unit Portions Eliminated	(count)	11	32
		(acres)	7,413	14,004

Table 2-27 Comparison of Applicant Proposed and Agency Preferred Alternatives Across Entire Project

	Topic	Detail (units)	Applicant Proposed	Agency Preferred
Plan Amendments				
(2.a)	Location, length, and reason for plan amendment		RFO (58 miles)—Expand existing and designate new utility corridor LSFO (42 miles)—New utility corridor VFO (19 miles)—New utility corridor LVFO (1 mile)—ISA corridor exception	RFO (76 miles)—Expand existing and designate new utility corridor LSFO (37 miles)—New utility corridor VFO (22 miles)—New utility corridor SLFO (3 miles)—New utility corridor LVFO (1 mile)—ISA corridor exception

3.0 Affected Environment and Environmental Consequences

This chapter describes the natural and human environment in the areas potentially affected by the TWE Project, and discloses the anticipated impacts from the proposed project, alternatives, and design options.

Each environmental or human resource section in this chapter contains subsections that discuss the regulatory framework (if applicable), data sources, analysis area, current (baseline) conditions, and impacts. Both the baseline conditions and impacts are discussed in the context of the four project regions described in Section 2.5, Alternative Transmission Line Routes and Ancillary Facilities.

Affected Environment

Baseline conditions are described in regional terms to provide an environmental setting. Where possible, resource data was mapped to indicate similarities and differences in resources intercepted by the various alternative corridors.

Environmental Consequences

The impact discussion includes more specific details regarding the resources that may be affected by the proposed action and alternatives. Direct, indirect, and cumulative impacts to the resources are discussed. Direct and indirect impacts are contained within this chapter. Cumulative impacts are discussed in Chapter 5.0.

The impact topics for each environmental or human resource are discussed in the following order:

- Northern and Southern terminal construction, operation, maintenance, and decommissioning. These facilities are common to all alternatives.
- Impacts common to alternative transmission line route alternatives and their associated components (e.g., access roads, transmission line tower sites, temporary work areas). This includes transmission line construction, operation, maintenance, and decommissioning. For each impact issue, agency stipulations and BMPs and applicant-committed design features (**Appendix C**) were considered at a local level to estimate the levels of project impact more accurately. If necessary, additional mitigation measures were recommended to further reduce or avoid impacts, and measure effectiveness described. Conclusion statements summarize the anticipated residual impacts.
- Quantified impact levels were tabulated for comparison by alternative within each project region, and impacts unique to each region described. A residual impact conclusion is provided for each major route alternative within each region to allow for comparisons among alternatives. Impact levels and comparisons among route variations, route connecters, and ground electrode sites also are provided, depending on regional location.
- The estimated impacts of design options are provided, based on available information.
- The effects of the No Action Alternative (continuation of current trends) are provided for each resource.

Within each resource section is an analysis of the direct and indirect impacts of these components based on the specific impacts that may occur, but a general approach and methodology for determining an impact parameter for direct impacts such as ground disturbance from construction (decommissioning would be similar) and operation (including maintenance) was developed and used for many resources.

Because the actual location of project facilities (e.g., access roads, transmission line tower sites, temporary work areas, terminal locations, and electrode bed sites) has not been established, reference lines have been established and TransWest has provided acreages of the disturbance necessary to develop transmission line segments according to assumptions (see **Appendix D**). For the purposes of analysis, a 250-foot-wide transmission line ROW was assumed to be centered on these reference lines. This 250-foot-wide ROW allows for the quantification of Project impacts and relative comparison between alternatives. During final engineering design, this 250-foot-wide transmission line ROW would be shifted as needed within the 2-mile transmission line corridor to address resource issues and facilitate compliance with design features and mitigation measures.

The impact parameter methodology used GIS analyses to characterize the resources in areas identified as potential disturbance locations (e.g., 250-foot-wide transmission line ROW and 2-mile transmission line corridor). The resource characterizations were applied as a ratio to the disturbance acreages by transmission line segment. A simplified example follows: Segment 1's 250-foot-wide transmission line ROW consists of 40 percent grassland and 60 percent shrubland, and TransWest identifies 10 acres of disturbance within the ROW during construction, then this methodology quantifies 4 acres of grassland and 6 acres of shrubland disturbed in the ROW during construction.

This same ratio approach was applied to the 2-mile transmission line corridor, and the two quantities were totaled for each segment. Additional 250-foot-wide transmission line ROW clearing was calculated as the remainder of the total ROW area after construction disturbance occurs. The impacts of segments comprising the regional alternatives identified in the EIS (see Section 2.5, Alternative Transmission Line Routes and Ancillary Facilities) were then summed. The result of this methodology is an estimate of the total disturbance to the specific resource by regional alternative.

3.1 Climate and Air Quality

This section describes the climate and existing air quality resource of the region and the applicable air regulations that would apply to the proposed action and alternatives.

3.1.1 Regulatory Background

The Federal CAA amendments of the 1990s require all states to control air pollution emission sources so that National Ambient Air Quality Standards (NAAQS) are met and maintained. The NAAQS are established by the USEPA, are outlined in 40 CFR 50, and represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except the annual standards, which may never be exceeded. An area that does not meet the NAAQS is designated as a nonattainment area on a pollutant-by-pollutant basis. In addition to these requirements, the NPS Organic Act requires the NPS to protect the natural resources of the lands it manages from the adverse effects of air pollution.

The Clean Air Act identifies two types of national ambient air quality standards. ***Primary standards*** provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. ***Secondary standards*** provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The criteria for potential air quality impacts include NAAQS requirements for carbon monoxide (CO), particulate matter (PM) with an aerodynamic diameter of 10 micrograms or less (PM_{10}), PM with an aerodynamic diameter of 2.5 micrograms or less ($PM_{2.5}$), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2)/oxides of nitrogen (NO_X). Applicable federal and state criteria are presented in **Table 3.1-1**.

Table 3.1-1 National and State Ambient Air Quality Standards

		State Standards	National Standards	
Pollutant	**Averaging Time**	**Concentration**	**Primary**	**Secondary**
Ozone	8-Hour	0.08 ppm	0.08 ppm	0.08 ppm
CO	1-Hour	35 ppm	35 ppm	35 ppm
	8-Hour	9 ppm	9 ppm	9 ppm
SO_2[3]	1-hour	0.075 ppm	0.075 ppm	None
	3-Hour	0.5 ppm	None	0.5 ppm
	24-Hour	None	None	None
	Annual Average	0.030 ppm	0.030 ppm	None
NO_2	1-hour	100 ppb	100 ppb	None
	Annual Average	53 ppb	53 ppb	53 ppb
PM_{10}	24-Hour	150 µg/m^3	150 µg/m^3	150 µg/m^3
	Annual Average[1]	50 µg/m^3	None	None
$PM_{2.5}$	24-Hour	35 µg/m^3	35 µg/m^3	35 µg/m^3
	Annual Average	12 µg/m^3	12 µg/m^3	12 µg/m^3

[1]Annual Average PM_{10} standard remains in effect in Wyoming and Nevada.

µg/m^3 = micrograms per cubic meter

In addition to the designations relative to attainment of conformance with the NAAQS, the CAA requires the USEPA to place selected areas within the U.S. into one of three categories, which are designed to limit the deterioration of air quality when it is better than the NAAQS. Class I is the most restrictive air quality category. It was created by Congress to prevent further deterioration of air quality in national

parks and wilderness areas of a given size, which were in existence prior to 1977, or those additional areas that have since been designated Class I under federal regulations (40 CFR 52.21).

Federal Class I areas, which include certain national wilderness areas, national memorial parks, and national parks, are afforded the highest level of protection. The visibility program is codified at: 42 U.S.C. §§ 7491 to 7492 (CAA §§ 169A to 169B). Implementing regulations for this provision are at 40 CFR 51.300 through 40 CFR 51.309. The locations of these Federal Class I areas are depicted in relation to the Project in **Figure 3.1-1**. Ambient air criteria that apply within PSD Class I areas are more stringent than those that apply to other areas (i.e., Class II areas). In addition to more stringent ambient air increments, Class I areas also are protected by the regulation of air quality related values (AQRVs) within their borders. Federal Land Managers (FLMs) are responsible for the management of Class I areas. Haziness is characterized by an index with deciview (dv) units, which are related to the logarithm of the sum of the particulate extinction coefficient (b_{ex}) and Rayleigh scattering. A change of 1 dv is usually perceived as a small change in haziness, regardless of the initial haze level.

3.1.2 Data Sources

Data sources for Section 3.1, Climate and Air Quality include climate data from the National Oceanographic and Atmospheric Administration (NOAA) State Climatologist Programs, and Western Region Climate Center (WRCC) station climate summaries; air pollution data from USEPA Air Quality System and National Emission Inventory databases, as well as information from the states of Wyoming, Colorado, Utah, and Nevada, and Clark County, Nevada.

3.1.3 Analysis Area

The analysis area for direct air quality impacts is the area within 5 kilometers (km) of the proposed and alternative reference lines.

3.1.4 Baseline Description

3.1.4.1 Climate

The climate in the northern portions of the project is characterized as arid, with cold winters and warm summers. The climate in the central portions of the Project also is arid, and the winter temperatures are similar to those in Wyoming; however, seasonal temperatures tend to be a little warmer. Annual precipitation (rainfall and snowfall) in the northern and central region ranges from 8 inches to well over 25 inches and is highly dependent on elevation and aspect of the terrain. The climate in the southern portions of the project in Nevada is hotter and drier, with generally mild winters and annual average precipitation below 5 inches.

Representative climate summaries for various regions across the analysis are including Rawlins, Wyoming; Maybell, Colorado; Rifle, Colorado; Duchesne, Utah; Milford, Utah; Caliente, Nevada; and Las Vegas, Nevada, are presented in **Tables 3.1-2** through **3.1-8**. As an example of rainfall variability across the analysis area, 30 years of precipitation data for Ashford Canyon, in Garfield County, approximately 18 miles north of Grand Junction, Colorado, is displayed in **Figure 3.1-2**. The locations of these climate stations in relation to the Project are depicted in **Figure 3.1-1**.

Southwestern Wyoming is quite windy, and during the winter there are frequent periods when the wind reaches 30 to 40 miles per hour (mph) with gusts to 50 or 60 mph. Prevailing wind directions in the different localities vary from west-southwest through west to northwest. In many localities, winds are so strong and constant from those directions that trees show a definite lean towards the east or southeast (NOAA 1985).

Wind speeds over elevated terrain are often greater than those recorded for nearby airports or other wind monitors.

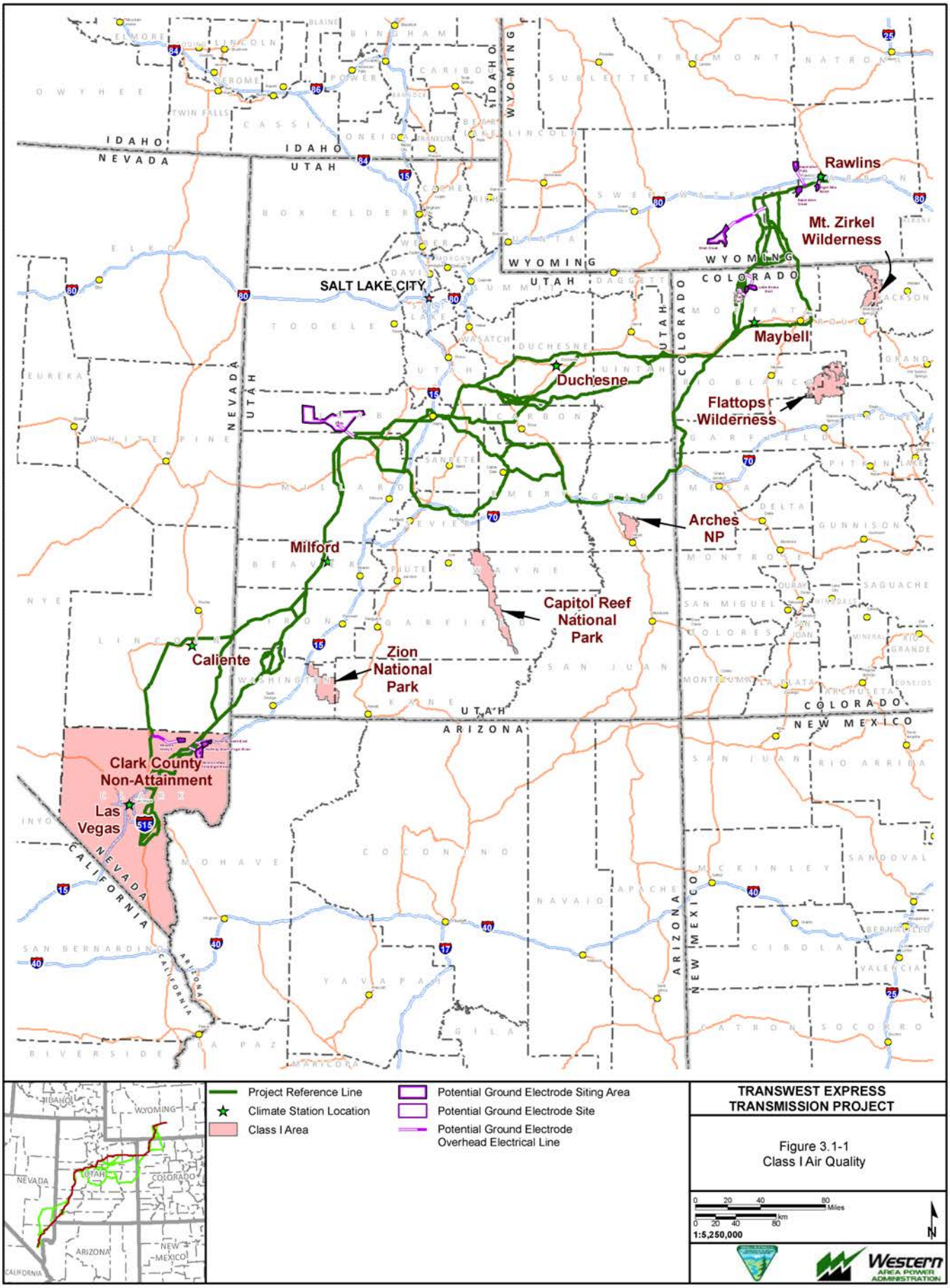

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Table 3.1-2 Monthly Climate Summary for Rawlins, Wyoming

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	30.9	12.7	0.48	7.9	2
February	33.8	14.6	0.51	7.5	2
March	41.2	20.3	0.67	7.8	1
April	52.5	27.7	1.04	7.1	0
May	63.8	36.4	1.32	1.6	0
June	75.2	44.6	0.90	0.2	0
July	83.7	51.4	0.74	0.0	0
August	81.1	50.0	0.75	0.0	0
September	70.5	40.8	0.80	1.2	0
October	57.1	31.2	0.80	3.4	0
November	40.5	20.3	0.58	7.7	1
December	32.1	14.0	0.47	7.5	1
Annual	55.2	30.3	9.05	51.9	1

Source: WRCC 2011.

Period of Record: 3/6/1951 to 12/31/2005.

Table 3.1-3 Monthly Climate Summary for Maybell, Colorado

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	32.3	1.9	0.82	12.3	6
February	37.4	7.1	0.84	10.2	5
March	47.9	17.9	1.07	8.9	2
April	29.0	25.8	1.34	4.5	0
May	69.6	33.4	1.14	0.9	0
June	79.6	40.6	0.99	0.1	0
July	87.2	47.0	0.78	0.0	0
August	84.5	45.6	0.91	0.0	0
September	74.8	36.2	1.16	0.4	0
October	62.7	25.3	1.21	1.8	0
November	45.9	15.3	1.13	9.6	1
December	34.1	4.1	1.00	13.1	4
Annual	59.6	25.0	12.38	61.8	2

Source: WRCC 2011.

Period of Record: 4/3/1958 to 12/31/2010.

Table 3.1-4 Monthly Climate Summary for Rifle, Colorado

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	36.8	9.3	0.86	11.0	4
February	43.9	16.6	0.77	7.6	3
March	53.8	24.2	0.97	3.7	0
April	64.2	31.4	1.01	0.8	0
May	74.0	38.7	1.00	0.0	0
June	84.0	45.2	0.73	0.0	0
July	90.2	52.1	1.03	0.0	0
August	87.7	50.4	1.14	0.0	0
September	79.4	41.5	1.14	0.0	0
October	67.3	31.1	1.19	0.5	0
November	51.4	21.2	0.88	3.7	0
December	39.4	12.4	0.93	11.1	2
Annual	64.3	31.2	11.61	38.5	1

Source: WRCC 2011.

Period of Record: 4/3/1958 to 12/31/2010.

Table 3.1-5 Monthly Climate Summary for Duchesne, Utah

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	31.2	4.7	0.55	6.1	2
February	37.7	11.5	0.59	5.8	2
March	50.1	22.7	0.69	3.7	0
April	61.7	30.6	0.74	1.0	0
May	71.6	38.4	0.85	0.2	0
June	80.6	45.4	0.80	0.0	0
July	87.1	52.4	0.92	0.0	0
August	84.8	50.8	1.23	0.0	0
September	76.3	41.6	1.07	0.0	0
October	63.3	31.4	0.97	0.7	0
November	46.6	19.7	0.53	2.6	0
December	33.8	9.0	0.59	5.7	1
Annual	60.4	29.8	9.51	25.7	0

Source: WRCC 2011.

Period of Record: 4/3/1906 to 12/31/2005.

Table 3.1-6 Monthly Climate Summary for Milford, Utah

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	39.1	13.6	0.65	6.8	2
February	45.6	19.6	0.77	5.7	1
March	54.6	25.3	1.04	6.7	0
April	63.9	31.6	0.87	3.2	0
May	73.8	39.3	0.72	1.0	0
June	84.5	46.9	0.46	0.0	0
July	92.1	55.8	0.71	0.0	0
August	89.7	54.1	0.86	0.0	0
September	80.7	43.8	0.70	0.2	0
October	67.8	32.6	0.91	1.1	0
November	52.5	22.2	0.65	3.6	0
December	41.3	14.9	0.71	5.8	1
Annual	65.5	33.3	9.03	34.0	0

Source: WRCC 2011.

Period of Record: 11/1/1906 to 12/31/2005.

Table 3.1-7 Monthly Climate Summary for Caliente, Nevada

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	46.6	17.8	0.82	3.5	0
February	52.4	22.9	0.94	2.6	0
March	60.6	28.3	1.01	1.2	0
April	68.8	34.3	0.70	0.2	0
May	78.6	42.0	0.52	0.0	0
June	88.5	49.5	0.34	0.0	0
July	95.4	56.6	0.77	0.0	0
August	93.1	55.3	0.88	0.0	0
September	85.2	46.1	0.62	0.0	0
October	73.4	35.1	0.78	0.1	0
November	59.1	25.1	0.68	0.7	0
December	48.3	18.9	0.66	2.9	0
Annual	70.8	36.0	8.72	11.2	0

Source: WRCC 2011.

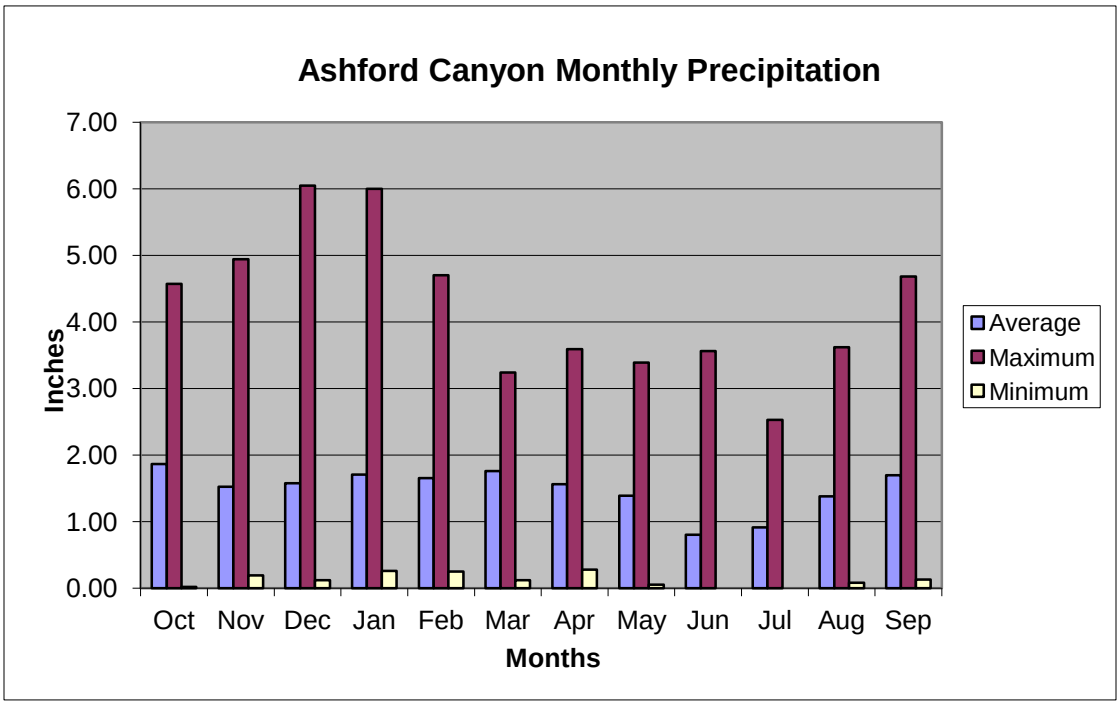
Period of Record: 4/1/1903 to 12/23/2010.

Table 3.1-8 Monthly Climate Summary for Las Vegas WSO Airport, Nevada

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	57.1	34.5	0.52	0.7	0
February	62.5	38.9	0.58	0.0	0
March	69.4	44.3	0.44	0.0	0
April	78.2	51.7	0.20	0.0	0
May	88.4	61.1	0.15	0.0	0
June	98.6	70.0	0.07	0.0	0
July	104.6	76.7	0.43	0.0	0
August	102.2	74.9	0.43	0.0	0
September	94.7	66.6	0.31	0.0	0
October	81.3	54.4	0.26	0.0	0
November	66.5	42.1	0.36	0.1	0
December	57.3	34.9	0.41	0.1	0
Annual	80.1	54.2	4.16	0.9	0

Source: WRCC 2011.

Period of Record: 2/1/1937 to 12/23/2010.



Source: BLM GJFO

Figure 3.1-2 Ashford Canyon Monthly Precipitation for Water Years 1981 – 2011

3.1.4.2 Air Quality

Three important meteorological factors influence the dispersion of pollutants in the atmosphere: mixing height, wind (speed and direction), and stability. Mixing height is the height above ground within which rising warm air from the surface will mix by convection and turbulence. Local atmospheric conditions, terrain configuration, and source location determine dilution of pollutants in this mixed layer. Mixing heights vary diurnally with the passage of weather systems and with season. Temperature inversions, where air temperatures near the ground are colder than the temperatures above, are common in the basins and other lower elevations of the region. Inversions commonly occur in winter when snow accumulation on the ground combines with short daylight hours. In summer, inversions dissipate rapidly when early morning sunlight warms the air near the ground surface. Inversions can hinder air pollutant dispersion by preventing emissions from mixing with the ambient air in the vertical direction. On average, mean morning mixing heights in the area are approximately 1,000 feet; mean afternoon mixing heights are more than 7,800 feet (Holzworth 1972). Mean morning mixing heights tend to be lowest in fall and highest in spring.

Morning atmospheric stability conditions tend to be stable because of the cooling of the layers of air nearest the ground. Afternoon conditions, especially during the warmer months, tend to be neutral to unstable because of the rapid heating of the surface under clear skies. During the winter, periods of stable afternoon conditions may persist for several days in the absence of synoptic (continental scale) storm systems to generate higher winds with more turbulence and mixing. A high frequency of inversions at lower elevations during the winter can be attributed to the nighttime cooling and sinking air flowing from higher elevations to the low lying areas in the basins. Although winter inversions generally are quite shallow, they tend to be more stable because of reduced surface heating.

The latitude of the proposed transmission line project is within the belt of prevailing westerly winds that circle the globe around the earth's northern hemisphere. However, much of the proposed project activities would be located in complex terrain where the local winds are affected by topographic features.

Because of the typically dry atmosphere throughout these western states, bright sunny days and clear nights frequently occur. This diurnal cycle allows rapid heating of the ground surface during daylight hours and rapid cooling at night. Since heated air rises, and cooled air sinks, winds tend to blow uphill during the daytime and down slope at night. This upslope and downslope cycle generally occurs in all the geographical features, including mountain range slopes and river courses. The complexity of terrain features cause complex movements in the cyclic air patterns, with thin layers of moving air embedded within the larger scale motions. The lower level, thermally driven winds also are embedded within larger scale upper wind systems (synoptic winds). Synoptic winds in the region are predominantly west to east, are characterized by daily weather variations that enhance or diminish the boundary layer winds, and are significantly channeled by regional and local topography.

Air pollutant dispersion also is dependent on wind direction and speed. Wind direction is highly influenced by the local terrain, and will vary along the transmission line routes.

Air quality in a given location is defined by pollutant concentrations in the atmosphere and is generally expressed in units of parts per million (ppm) or $\mu g/m^3$. One measure of a pollutant is its concentration in comparison to the NAAQS and/or state ambient air quality standard, such as those established by Wyoming. These standards represent the maximum allowable atmospheric concentrations that may occur without jeopardizing public health and welfare, and include a reasonable margin of safety to protect the more sensitive individuals in the population. The State of Wyoming has adopted the NAAQS as state air quality standards and has additional AAQS for other pollutants that are more applicable to oil and gas projects (e.g., hydrogen sulfide) and are not included in this document in an effort to retain clarity. Colorado, Utah, and Nevada standards that are pertinent to the impacts from this project are the same as the NAAQS. The pollutants of interest for the proposed project are listed below.

3.1.4.3 Regional Sources of Criteria Air Pollutants

According to the USEPA Airdata website, the largest industrial sources of emissions of criteria pollutants in the analysis area include refineries and power plants. Other industrial, commercial, or government facilities in the general area also may be sources of the criteria pollutants.

Regional Air Quality

The existing air quality of most of the analysis area is typical of the largely undeveloped regions of the western U.S. Current sources of air pollutants in the region include wildland fires, mining, agriculture, industrial sources, urban transportation, rural transportation on unpaved roads, construction activities, and disturbed land. With the exception of urban transportation, which emits other air pollutants, all of these sources predominately emit PM. PM is the primary pollutant of concern in the project development area.

For the purposes of statewide regulatory planning, all of the northern portions of the analysis area have been designated by USEPA as attainment areas for all pollutants that have an AAQS; however, Clark County, Nevada, is designated as nonattainment or maintenance area for specific pollutants. This nonattainment area is depicted in relation to the Project in **Figure 3.1-2**.

Particulate Matter

Natural sources of PM are dust generated by wind across unvegetated soil surfaces and by wildland fire. Dry playa basins and areas cleared of vegetation are particularly susceptible to dust generation, particularly where soils are silty. In southern Nevada including the Las Vegas area, most PM air pollution is a result of windblown dust from disturbed ground.

The size of PM is important from a human health perspective. There are three common size classifications of PM: the largest size classification is total suspended particulate (TSP), the second largest classification is PM_{10}, and the smallest classification is $PM_{2.5}$.

The southern portion of the Project is in Clark County, where the air quality is very different from the rest of the analysis area due to the influence of the Las Vegas metropolitan area. Particulate data collected by Clark County at a site in Apex near Highway 93 and I-15 are listed in **Table 3.1-9**. The second highest 24-hour PM_{10} concentrations measured at USEPA monitoring stations in Clark County have exceeded 150 µg/m^3, which is above both National and State of Nevada AAQS. This has caused Hydrographic Basin 212 (all of Clark County) to be designated as a nonattainment area for PM_{10} (see **Appendix E** for additional information regarding attainment designations).

Table 3.1-9 Intersection of Highway 93 and I-15 Apex, Nevada PM_{10} Concentrations 2002-2007

Year	24-hour PM_{10} (µg/m^3)			Annual PM_{10} (µg/m^3)
	Maximum	Day Maximum Recorded	Second Highest	
2002	465[1]	04/15/02	176	26.4
2003	348[1]	10/30/03	105	23.8
2004	150	05/10/04	85	19.1
2005	97	05/16/05	72	18.9
2006	152[1]	09/15/06	97	17.7
2007	255[1]	06/05/07	96	23.2

[1]Includes exceptional events.

Source: USEPA 2008a.

USEPA made the determination that the Las Vegas Valley is in attainment with the PM_{10} NAAQS on August 3, 2010 (75 FR 45485), and will re-designate the area to attainment upon approval of the pending maintenance plan and request for re-designation that was submitted to USEPA in August 2012. Average annual PM_{10} concentrations in this region generally range from 20 to 30 µg/m^3, which is below the 50 µg/m^3 State of Nevada AAQS (USEPA 2008a).

Maximum measured values of 24-hour PM_{10} shown in **Tables 3.1-9** include exceptional events such as wildfires and dust storms. The frequency and severity of exceptional events can be an indicator of regional dust storm activity. In Clark County, Nevada exceptional events occurred 4 times in a 6 year period from 2002-2007, as shown in **Table 3.1-9**.

Ozone

Monitoring results in Las Vegas Valley (HB 212) in Clark County have exceeded the current 8-hour ozone standard. In 2004, the USEPA designated hydrographic basins 164A, 164B, 165, 166, 167, 212, 213, 214, 216, 217, and 218 as nonattainment for the 8-hour ozone standard.

In March 2004, Nevada submitted an 11-factor analysis indicating that the Las Vegas nonattainment area was much smaller than the presumptive area and that the smaller area proposed was consistent with the definition of nonattainment in section 107(d)(1) of the Clean Air Act. The USEPA concurred with this smaller boundary, and excluded the Las Vegas Paiute Tribal Community and the Moapa Band of Paiute Tribal Land and other tribal lands within Clark County, Nevada. The State recommended nonattainment areas include all violating air monitors in the Las Vegas area. The Joe Neal (elementary school) site had a design value of 86 parts per billion (ppb) for 2001 to 2003, just 1 ppb greater than the trigger for nonattainment designation, 85 ppb. On March 29, 2011 (76 FR 17343), the USEPA re-designated Clark County as attaining the standard for ozone. In April, 2011, Clark County submitted to the USEPA an Ozone Re-designation Request, along with a maintenance plan for a formal re-designation from nonattainment to attainment for the 1997 8-hour ozone NAAQS. On November 13, 2012, USEPA published the proposed rule for Approval of the Maintenance Plan and Re-designation of Clark County for the 1997 8-Hour Ozone Standard.

Carbon Monoxide

In 2000, the Clark County, Department of Air Quality submitted to the USEPA a CO State Implementation Plan (SIP), describing control measures and technologies to bring Las Vegas into compliance with the CO NAAQS.

Prevention of Significant Deterioration

The closest Class I areas to project alternative routes are Zion National Park (20 miles to the east), Arches National Park (10 miles to the south), Flat Tops Wilderness (30 miles south), and Mount Zirkel Wilderness (50 miles east) (**Figure 3-1.1**). Areas outside of the designated Class I boundaries are designated as Class II areas, which are allowed a relatively greater deterioration of air quality, although it must still be maintained below NAAQS. Dinosaur National Monument and Lake Mead NRA are Class II areas. No Class III areas have been designated in the U.S.

Regional Air Quality Related Values

AQRVs include changes in visibility or atmospheric deposition of pollutants to soils and waterbodies. Regional haze is visibility impairment caused by the cumulative air pollutant emissions from numerous sources over a wide geographic area. Visibility impairment is caused by particles and gases in the atmosphere. Some particles and gases scatter light while others absorb light. The primary cause of regional haze in many parts of the country is light scattering resulting from fine particles (i.e., $PM_{2.5}$) in the atmosphere. Additionally, coarse particles between 2.5 and 10 microns in diameter can contribute to light extinction. Coarse particulates and $PM_{2.5}$ can be naturally occurring or the result of human activity.

The natural levels of these species result in some level of visibility impairment, in the absence of any human influences, and will vary with season, daily meteorology, and geography (Malm 1999).

The total nitrogen deposition trend is relatively stable at around 2.0 kilograms per hectare (approximately 40 percent from dry deposition and the remaining 60 percent from wet deposition). The total sulfur deposition trend is relatively stable, perhaps decreasing slightly over the last 10 years, and is approximately 0.7 kilograms per hectare (approximately 30 percent from dry deposition and the remaining 70 percent from wet deposition) (CASTNet 2010).

3.1.4.4 Visibility

The smallest dv values, or best visibility, are in a broad region including the Great Basin, most of the Colorado Plateau, and portions of the central Rockies, which have visibility impairment of less than 8 dv (Hand 2011). The annual mean dv reported from the IMPROVE network has shown an improvement from the baseline years of 2000-2004 in the vicinity of the proposed project. All IMPROVE monitors in Utah, Colorado, and Wyoming have shown this trend (Hand et al. 2011).

3.1.5 Regional Summary

Table 3.1-10 is a summary of air quality conditions and visibility concerns by Project region.

Table 3.1-10 Air Quality and Visibility by Region

	Exceedances of Air Quality Standards					Visibility
	NO_2	O_3	SO_2	PM_{10}	$PM_{2.5}$	Class I Areas
Region I	No	No	No	No	No	No
Region II	No	Yes[1]	No	No	No	No
Region III	No	No	No	No	No	No
Region IV	No	Yes	No	Yes	No	No

[1] Winter ozone exceedances of NAAQS were recorded in the Uintah Basin during the winter 2010-2011. Area is designated un-classifiable and is treated as attainment.

3.1.5.1 Region I

Air quality monitoring data show that air quality in Region I is considered to be in compliance with state and Federal ambient air quality standards. Past exceedances of the PM_{10} NAAQS in the region are associated with exceptional events (USEPA 2012a).

3.1.5.2 Region II

Air quality monitoring data show that air quality in northwestern Colorado and northeastern Utah is considered to be in compliance with state and Federal ambient air quality standards. There were ozone exceedances recorded in the Uintah Basin during the winter of 2010-2011; however, the region remains designated as un-classifiable and is treated as in attainment (USEPA 2012b). There were no ozone exceedances in the Uintah Basin during the winter of 2011 through 2012. The Proposed Route and Alternatives are near Dinosaur National Monument, which is classified under PSD as a Class II sensitive area, and Arches and Capitol Reef national parks, which are Class I. Flat Tops Wilderness, located about 40 miles south of the easternmost alternative, and Mount Zirkel Wilderness, located about 50 miles east of the easternmost Alternative route are PSD Class I areas.

3.1.5.3 Region III

Air quality monitoring data show that air quality in southwestern Utah is considered to be in compliance with state and Federal ambient air quality standards. The Proposed Route through southwest Utah passes within about 20 miles of Zion National Park, which is classified under PSD as a Class I area.

3.1.5.4 Region IV

Much of the southern portion of the Project is located in Clark County, where the air quality is considered to be nonattainment for ozone (8-hour) and PM_{10} (24-hour). The Moapa River Indian Reservation and the Fort Mojave Indian Reservation in Clark County are excluded from the ozone nonattainment area. As of September 27, 2010, Clark County has been re-designated to a maintenance area for CO. The nonattainment status of Clark County requires a conformity demonstration that is discussed in Section 3.1.6.

3.1.5.5 Global Changes

Ongoing scientific research has identified the potential impacts of anthropogenic (man-made) greenhouse gas emissions and changes in biological carbon sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these greenhouse gas emissions and net losses of biological carbon sinks (e.g., vegetation) could cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space (Intergovernmental Panel on Climate Change [IPCC] 2007).

Global climate model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes (IPCC 2007). Warming during the winter months is expected to be greater than increases in daily maximum temperatures. Increases in temperatures would increase water vapor in the atmosphere and reduce soil moisture, increasing generalized drought conditions, while at the same time enhancing heavy storm events. Although large-scale spatial shifts in precipitation distribution may occur, these changes are more uncertain and difficult to predict.

As with any field of scientific study, there are uncertainties associated with the science of climate change. This does not imply that scientists do not have confidence in many aspects of climate change science. Some aspects of the science are known with virtual certainty, because they are based on well-known physical laws and documented trends (USEPA 2008b).

Several activities contribute to the phenomena of climate change, including emissions of greenhouse gases (especially carbon dioxide [CO_2] and methane) from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and surface reflectivity (i.e., albedo). It is important to note that greenhouse gases will have a sustained climatic impact over different temporal scales. For example, recent emissions of CO_2 can influence climate for hundreds of years.

Emissions of CO_2 from fossil fuel use and from the effects of land use change on plant and soil carbon are the primary sources of increased atmospheric CO_2. Since 1750, it is estimated that about two-thirds of anthropogenic CO_2 emissions have come from fossil fuel burning and about one-third from land use change. For the southwestern U.S. subregion, it is estimated that the present emissions rate of CO_2 equivalents (CO_2e) (a way of expressing all the different greenhouse gases as a single number) for power generation is 1,258 lb/megawatt hours (MWh) (**Table 3.1-11**). This is compared to the NWPP of 863 lb/MWh, where much of the electrical generation comes from renewable sources, primarily hydroelectric. On average, each MWh of electricity from wind and solar energy delivered to the Las Vegas area will avoid emissions from fossil fuel burning by over 1,000 lb/MWh.

Table 3.1-11 CO_2e Emission Rates for the Southwestern and Northwestern U.S. Subregions

Subregion	Name	Location	Emissions CO_2 (tons)	Emissions Rate (lb/MWh)	Emissions CH_4 (tons)	Emissions rate CH_4 (lb/MWh)	Emissions N_2O (tons)	Emissions rate N_2O (lb/MWh)	Emissions CO_2e (tons)	Emissions rate CO_2e (lb/MWh)
AZNM	WECC	Southwest	113,156,263	1,253	3,396,787	19	2,993,639	17	113,656,000	1,258
NWPP	WECC	Northwest	115,898,956	859	4,410,058	16	3,682,826	14	116,516,100	863

Source: Year 2007 eGRID Subregion Emissions – GHG (eGRID2010 Version 1.1 Created May 2011).

3.1.6 Impacts to Air Quality

Impacts to air quality include increases in criteria pollutants including fugitive dust emissions, emissions of hazardous air pollutants and greenhouse gas (GHG) emissions. Local effects are analyzed within 5 km of the project boundaries; cumulative effects are analyzed within 100 km of project boundaries. Generally, minor surface-based particulate emissions have maximum impact levels within 500 m of the source, and do not have noticeable effects (i.e., greater than 1 $\mu g/m^3$) in areas beyond 5 km. Visibility impacts to Class I areas are analyzed at much greater distances. **Table 3.1-12** lists the relevant management considerations for air quality.

Table 3.1-12 Relevant Management Considerations for Air Quality

Resource Topic	Management Considerations
NAAQS	Compliance with NAAQS and state standards
Visibility	Federal guidelines for visibility impairment
Atmospheric Deposition	Federal guidelines for atmospheric deposition
GHG	Climate Change

Issues

- Air pollutants emitted from the tailpipes of construction equipment, including criteria pollutants and greenhouse gas emissions;
- Fugitive dust generated during construction and facility maintenance;
- Windblown dust generated due to wind erosion of disturbed surfaces;
- Impairment of visibility conditions in Class I areas (e.g., Zion and Arches national parks); and
- Conformity requirements in nonattainment areas.

Assumptions

Assumptions regarding compliance with regulatory requirements, detailed project operations, inputs for emission factors, and future conditions are required to estimate impacts to air quality and climate.

Key assumptions regarding compliance with regulatory requirements include:

- All state and local air quality construction permits will be received prior to initiation of project construction;
- Dust control plans will be prepared and submitted as required by the responsible agencies; and

- Any operating permits or dust control plans required in nonattainment areas will address conformity requirements or demonstrate that total emissions in nonattainment areas will be below applicable thresholds.

Methodology for Analysis

Project construction air quality emissions and impacts are similar within each Region, and can be classified as consisting of area and point sources. Emissions from construction activities are classified as area sources, would be confined to the daytime hours, and would occur only during active construction periods. Such emissions are transitory, moving with the construction progress, and temporary, not occurring in one area for a long duration. Point sources are identified as the portable concrete batch plants.

For the estimation of air quality related impacts, the methodology depends on the activity (construction equipment, windblown dust, etc.) and the type of air impacts (criteria emissions, greenhouse gases, etc.). The activity/air impact combinations are grouped together based on the issues identified above. The calculation methodology for each activity affecting air quality is described below.

Tailpipe Emissions from Construction Equipment and Facility Maintenance

Tailpipe emissions from construction are based on equipment-specific emission factors, the equipment type, the number of each type of equipment, and estimated hours of operation. Equipment-specific emission factors are from the California Environmental Quality Act, Air Quality Handbook (South Coast Air Quality Management District 2010). The hours of operation were calculated based on assumptions regarding typical construction activities.

Tailpipe emissions from maintenance vehicles are calculated the same as for construction equipment. Emissions are based on the emission factors for light-duty passenger vehicles (South Coast Air Quality Management District 2010) and the calculated maintenance trips.

The proposed construction equipment is comprised primarily of heavy-duty, non-road mobile equipment powered by diesel fuel. Only pickup trucks will operate on gasoline rather than diesel fuel. Emissions from diesel engines would be minimized because engines must be built to meet the standards for mobile sources established by the USEPA mobile source emissions regulations (40 CFR Part 85). In addition, the USEPA is requiring that the maximum sulfur content of diesel fuel for highway vehicles be reduced from 500 ppm by weight (ppmw) to 15 ppmw, making ultra low sulfur diesel available nationwide.

- For tailpipe emissions from construction equipment, assumptions include:
  - All construction equipment, except for pickup trucks, will consume ultra low sulfur diesel fuel. Pickup trucks are assumed to be equivalent to light-duty, gasoline powered, passenger vehicles.
  - Construction activities will occur for 12 hours per day, 6 days a week.
  - Not all pieces of construction equipment will operate simultaneously. At any given time, roughly a third of the equipment will be operating; thus, it is assumed that each piece of equipment operates 4 hours out of a 12-hour construction day. This is a conservative approach since a particular piece of equipment, such as a crane, has a very specific function and must remain on-site to perform this function, but this function is not required to occur continuously.
  - Pickup trucks used for transporting crews and other local trips, will make two trips per hour on average over a 12-hour work day (24 trips per day). Each trip is assumed to be 4 miles on average.

- Emission factors for year 2012 are used since this is predicted to be the first year of construction. Future years are anticipated to have lower emission rates due to federal and state emission reduction programs for mobile equipment.

Fugitive Dust Emissions from Construction Equipment and Facility Maintenance

Fugitive dust is lofted into the air by construction equipment during many types of activities: driving over unpaved surfaces, excavation of topsoil and rock, and transfer of excavated material from one place to another. The USEPA has developed a generic emission factor of 1.2 tons per acre per month for fugitive dust that includes all construction activities (USEPA 1995). The emission calculations for fugitive dust associated with construction activities are based on the estimated acres of land actively undergoing construction and emission factors for heavy construction operations from the USEPA (USEPA 1995). The estimate of area actively constructed on any given day includes the north and south terminals, transmission line, temporary construction staging areas, and access roads. However, all this area is not undergoing construction simultaneously; for the purposes of project emission calculations, it is estimated that approximately 5 percent of the regional acreage (roughly 2,040 acres per region) per day are under active construction. Fugitive dust emissions during construction will be controlled as specified in the required dust control plan. For the purposes of emission calculations, the estimated fugitive dust emissions are assumed to be reduced by 50 percent through use of appropriate control measures.

Localized air quality emissions at a given location are expected to occur during construction activities. Emissions from construction equipment will be controlled by following state and local regulations. Actual construction control measures are part of a Construction Plan and a Dust Control Plan. In addition, operating permits for stationary sources, such as batch plants and operating permits for larger combustion sources, such as engines greater than 250 horsepower, will be obtained prior to construction activities. The development of a Construction Traffic Management Plan with measures to reduce the number of construction trips also will reduce air emissions from construction transportation vehicles.

- For fugitive dust from construction and maintenance, assumptions include:
  - For north and south terminal facilities, 3.25 acres are actively being constructed per day. This is a conservative assumption for the purposes of estimating the maximum daily emissions of fugitive dust from construction equipment;
  - For the purposes of estimating the PM_{10} emissions associated with construction fugitive dust, it is assumed that 75 percent of the fugitive dust is in the PM_{10} size range (USEPA 1998). Similarly, the USEPA recommends that 10 percent of the PM_{10} is in the $PM_{2.5}$ size range (WRAP 2006);
  - Site grading is the primary general construction activity that would produce fugitive emissions;
  - A control efficiency of 50 percent is assumed for purposes of emission calculations. Controls will be described in the dust control plan; and
  - Facilities will be regularly maintained and a light-duty truck will travel the length of the transmission line once per month.

<u>Best Management Practices</u>

The following BMPs are included in the project plan:

The applicant shall cover construction materials and stockpiled soils if these are sources of fugitive dust.

- To minimize fugitive dust generation, the applicant shall water land before and during surface clearing or excavation activities. Areas where blasting would occur should be covered with mats (AIR-2);

- Dust abatement techniques (e.g., water spraying) shall be used by the applicant on unpaved, un-vegetated surfaces to minimize airborne dust. Water for dust abatement should be obtained and used by the applicant under the appropriate state water use permitting system. Used oil will not be used for dust abatement (AIR-3);
- Predict future impacts from externally initiated actions prior to approval of those actions. Comply with all applicable local, state, and federal regulations to limit air quality degradation;
- Reduce vehicle speeds on native surfaced roads (e.g. 15 mph)
- Restrict surface disturbing activities to periods when wind speeds are less than 25 mph.
- To minimize fugitive dust, the applicant shall cover, at all times when in motion, open bodied trucks, transporting materials likely to give rise to airborne dust; and
- Access roads and on-site roads should be surfaced with aggregate, wherever appropriate.

Applicant Committed Design Features include:

- The Construction, Operation, and Maintenance (COM) Plan will include a Dust Control and Air Quality Plan. Requirements of those entities having jurisdiction over air quality matters will be adhered to and dust control measures will be developed (TWE-47);
- Open burning of construction trash will not be allowed unless permitted by appropriate authorities (TWE-47); and
- The Contractor and Subcontractor(s) will be required to have and use air emissions control devices on construction machinery, as required by federal, state or local regulations or ordinances (TWE-48).

Greenhouse Gas Emissions

Construction of the project would result in gaseous emissions, including CO_2e from fuel combustion in construction vehicles.

Annual construction engine emissions of GHGs (CO_2e, which include CO_2, methane, and N_2O) from construction engine sources are less than 800 tpy for all alternatives. The total GHG emissions from construction would be negligible in terms of impacts to climate change. In the final regulation on greenhouse gas permitting, the USEPA considers a source that emits more than 100,000 tpy of CO_2e to be a major source and requires a stationary source that emits more than 25,000 tpy to report their emissions. An equivalency calculation indicates that the total CO_2e emissions from construction would release about the same amount of CO_2e as the annual energy use for 52 average households in the U.S.

There would be maintenance activities during operations at the terminals and along the transmission line resulting in fuel usage from mostly light duty vehicles. Assuming that the transmission line is used primarily to carry renewable energy, direct air emissions would be offset by reductions in gaseous emissions from existing fossil-fuel fired power plants that would produce less electricity or those fossil-fueled power plants that would not be constructed in the future to meet electrical demand.

Any potential savings in GHG emissions is based on the assumption that the transmission line would primarily transmit renewable energy that would replace energy demands that would otherwise be met by non-renewable power sources. However, if this transmission line ends up transmitting more electricity from non-renewable sources, the calculated decrease would not be realized.

Decommissioning of the project would result in gaseous emissions, including CO_2e; however, emissions would be less than those associated with construction of the project.

Criteria Pollutant Air Emissions – Area Sources

Construction emissions would occur during construction of all alternatives including the north and south terminals, ground electrode facilities, access roads, preparation of transmission structure sites, erecting those structures, and construction of the transmission line. Fugitive dust results from the use of earth-moving equipment, including loaders, scrapers, bulldozers, shovels, and backhoes.

Tailpipe emissions also would occur from mobile sources including earth-moving equipment such as scrapers, loaders, bulldozers, and backhoes during construction of access roads and preparation of structure sites as well as from pickup trucks and semi-tractor trailers used to transport crews and materials. Structure components and transmission line equipment, as well as electrical cable and other equipment and supplies would be delivered by large trucks and semi-tractors. Large cranes are used to install structures. Emissions from these activities include fugitive dust and tailpipe emission (CO, NO_X, volatile organic compounds [VOCs], particulates, SO_2, and air toxics).

Approximately 10,024 acres would be disturbed during the construction phase of TransWest's Proposed Action (Alternative A) distributed across the regions. Construction and reclamation activities are expected to take place over a span of about 2 years. Fugitive dust from construction activities and travel on project roads would be controlled by water trucks. An approximate conservative emission factor for uncontrolled particulate emissions from construction activity operations is 1.2 tons/acre/month of activity. This value is most useful for developing estimates of overall emissions from construction scattered throughout a large geographical area (USEPA 1995).

Fugitive dust emissions from disturbed areas assume 12 months of construction each year and 50 percent dust controls with water applied twice a day as needed. Construction would contribute to fugitive dust emissions and include personnel vehicle access, occasional road maintenance activities, and ongoing reclamation/re-vegetation activities.

Conclusions

- Assuming that the transmission line would carry 80 percent renewable energy, there would be a net production and transmission of about 16,000 GWh of power on an annual basis without the burning of fossil fuels. The USEPA GHG Equivalencies Calculator indicates that this is equivalent to CO_2e emissions of 12.2×10^6 tons per year. This is about the same as the electricity use of 1.4 million homes for 1 year.
- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the northern terminal would not cause state or federal air quality standards to be exceeded, based on a screening level air quality analysis.
- Based upon the use of conservative emissions estimates, the emissions from the construction and operation of TWE in the Clark County nonattainment area would be below the conformity thresholds; therefore, the Project is exempt from performing a comprehensive conformity analysis.
- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the southern terminal would not cause state or federal air quality standards to be exceeded, based on a conservative screening level air quality analysis.

Criteria Pollutant Emissions – Point Sources

Project construction air quality emissions and impacts are similar within each Region, and can be classified as consisting of point and area sources. The point sources for this project are the portable concrete batch plants that will be temporarily located approximately every 15 miles along the transmission line. Area sources are mobile sources, roadways, bulldozers, tractors, construction traffic, and other sources that cause emissions of air pollutants not situated at a fixed location.

Concrete for use in the structure foundations would be dispensed from portable concrete batch plants generally located at staging areas. Equipment typically required at a batch plant site includes generators, concrete trucks, front-end loaders, skid loaders, dump trucks, transport trucks and trailers, water tanks, concrete storage tanks, scales, and job site trailers. Rubber-tired trucks and flatbed trailers would be used to assist in relocating the portable plant along the transmission line. Commercial ready-mix concrete might be used when access to structure construction sites is economically feasible. Batch plant sites, although temporary in nature, would be fenced.

Concrete batch plants are proposed to provide concrete for the foundation for each structure. Highest annual emissions from concrete batch plants for all alternatives are shown in **Table 3.1-13**.

Table 3.1-13 Annual Point Source Emissions from Concrete Batch Plants (tons/year)

Pollutant	Highest
CO[1]	1.20
VOCs[1]	0.44
NO_X[1]	5.60
SO_2[1]	0.38
PM_{10}	5.2
$PM_{2.5}$	1.5

[1] Engine Emissions.

Calculations provided in **Appendix E**, **Table E-11**.

It is assumed that:

- Batch plants would be staged approximately every 15 miles along the transmission line route and produce concrete over the construction period. Emission factors are from USEPA AP-42, Volume 1, 5th Edition Chapter 11.12, Table 11.12-2 for Concrete Batching. Batch plant emissions PM_{10} and $PM_{2.5}$ data include total engine and batch emissions.
- The concrete batch plants would require air permits from state air permitting agencies. The air permit would provide enforceable limits and potential air pollution mitigation measures to reduce air emissions impacts from operation of the batch plants.

Screen3 Modeling Results

Screening dispersion modeling was performed to assess PM_{10} and $PM_{2.5}$ impacts of fugitive dust from disturbed acres during construction. Air modeling was performed using the USEPA-approved SCREEN3 model. SCREEN3 is a single source Gaussian plume model, which provides maximum ground-level concentrations for point, area, flare, and volume sources. SCREEN3 is a screening version of the Industrial Source Complex model. For this study, SCREEN3 model version 96043 was used to evaluate impacts from fugitive dust. The construction area was modeled as an area source using full meteorology as well as regulatory model default values for mixing heights and anemometer heights. Impacts were assessed at a distance of 50 meters from the disturbance that is representative of all such activities in the direct impacts assessment area. Results of the conservative screening level dispersion modeling analysis that are applicable throughout the entire Proposed Project for all Alternatives are shown in **Table 3.1-14** and indicate that the impacts due to fugitive dust emissions from disturbed acres are well within the National and State AAQS. Background levels shown in **Tables 3.1-14** and **3.1-15** are representative of the rural background levels for the pollutants throughout the region including the locations for the proposed transmission line and all Alternatives.

Table 3.1-14 SCREEN3 Model Results for Construction Fugitive Dust

Pollutant	Averaging Time	Impact (µg/m^3)	Background (µg/m^3)	Total Impact (µg/m^3)	NAAQS (µg/m^3)	Percent of NAAQS
PM_{10}	24-hour	0.8	10.2	11.0	150	7
	Annual	0.2	9	9.2	50	18
$PM_{2.5}$	24-hour	0.2	6.9	7.1	35	20
	Annual	0.1	2.6	2.7	12	22.5

Table 3.1-15 SCREEN3 Model Results for Heavy Duty Vehicles on Unpaved Roads

Pollutant	Averaging Time	Impact (µg/m^3)	Background (µg/m^3)	Total Impact (µg/m^3)	NAAQS (µg/m^3)	Percent of NAAQS
NO_2	1-hour	1.9	NA	1.9	188	1.0
	Annual	0.1	NA	0.1	100	0.1
CO	1-hour	0.9	NA	0.9	40,000	<0.1
	8-hour	0.6	NA	0.6	10,000	<0.1
SO_2	1-hour	0.1	NA	0.1	196	0.1
	3-hour	0.1	NA	0.1	700	<0.1
	24-hour	0.0	NA	0.0	365	<0.1
	Annual	0.0	NA	0.0	80	<0.1
PM_{10}	24-hour	39.9	10.2	50.1	150	33.4
	Annual	4.0	9	13.0	50	25.9
$PM_{2.5}$	24-hour	4.0	6.9	10.9	35	31.2
	Annual	0.4	2.6	3.0	12	25

Screening dispersion modeling also was performed to assess impacts of criteria pollutants from heavy and light duty truck emissions. Air modeling was performed using USEPA approved SCREEN3. The trucks were modeled as volume sources using full meteorology as well as regulatory model default values for mixing heights and anemometer heights. Gaseous pollutant emissions from light and heavy duty vehicles are much less than particulate emissions when vehicles are traveling on unpaved roads. Background concentrations of gaseous pollutants in rural settings are typically not available, since monitoring generally takes place where there are larger or more abundant sources of these pollutants. Impacts were assessed at a distance of 10 meters from the road for a generic road segment that is representative of all dirt roads throughout the analysis area. Results of the conservative screening level dispersion modeling analysis for heavy duty vehicles are shown in **Table 3.1-15** and indicate that the impacts from unpaved road traffic are well within the National and State AAQS. Impacts due to light duty vehicles (pickup trucks) on unpaved roads would be much less than impacts for the larger trucks.

Hazardous Air Pollutants Impacts

The regulated hazardous air pollutants (HAPs) listed in Section 112 of the CAA that would be emitted from construction activities are benzene, toluene, xylenes, acetaldehyde, formaldehyde, and propylene. Emissions of the remaining HAPs are orders of magnitude smaller. **Table 3.1-16** provides an estimate of emissions of HAPs in pounds per year for the range of transmission line alternatives.

Table 3.1-16 Principal Hazardous Air Pollutant (lbs/yr)

Pollutant	Low	High
Benzene	8.45	10.20
Toluene	3.70	4.48
Xylenes	2.58	3.12
Acetaldehyde	6.95	8.40
Formaldehyde	10.70	12.90
Propylene	23.40	28.30

HAPs are regulated by emissions only, and they do not approach the level of concern which is 10 tpy for individual HAPs or 25 tpy in aggregate. HAPs modeling was not performed for this project since the primary sources of HAPs are internal combustion engines used to power construction equipment and vehicles.

Impacts at Class I and II Areas – Acid Deposition

The proposed project would emit low levels of NO_X and SO_2, which are the potential acid producing pollutants emitted from mobile sources during construction and operation. However, by providing a conduit and contributing a portion of the power from renewable sources (i.e. solar and wind power) to the southwest region, the net impact of the project would be to improve atmospheric conditions since the generation of electricity from renewable sources would avoid the use of electricity generated in fossil fuel-fired power plants and their associated acid-producing pollutants.

Impacts at Class I and II Areas – Visibility

Background visibility data are available from Zion National Park and Arches National Park, and visibility is considered to be very good. Although construction of the proposed project would emit low levels of pollutants, principally PM_{10} and $PM_{2.5}$, as well as tailpipe emissions from mobile sources, the net impact of the project would be negligible as discussed below.

The FLMs have visibility protection responsibility under 40 CFR §51.307 (New Source Review), which spells out the requirements for SIP visibility protection programs, as well as 40 CFR §52.27 (Protection of visibility from sources in attainment areas) and 40 CFR §52.28 (Protection of visibility from sources in nonattainment areas). These three provisions, taken together along with the SIP-approved rules, establish the visibility protection program for new and modified sources throughout the country.

Section 165 (42 U.S.C. 7475) of the CAA requires the USEPA, or the State/local permitting authority, to notify the FLM if emissions from a proposed project may impact a Class I area. The permitting authority should forward PSD applications to the FLM for review and analysis as soon as possible after receipt, giving the FLM an opportunity to review the application concurrently with the permitting authority. TransWest's Proposed Action (Alternative A), and the other regional alternatives do not constitute a major PSD source and do not require notification to the FLM. Nonetheless, an assessment of visibility impacts has been made using FLAG screening level criteria.

The Agencies are using a fixed Q/D factor of 10 as a screening criteria for sources located greater than 50 km from a Class I area, where Q is the total emissions of certain pollutants in tons per year and D is the distance from the facility to the Class I area. Furthermore, the Agencies are expanding the screening criteria to include all AQRVs, not just visibility. Therefore, the Agencies will consider a source located greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRVs if its total SO_2, NO_X, PM_{10}, and H_2SO_4 annual emissions (in tons per year, based on 24-hour maximum

allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less. The Agencies would not request any further Class I AQRV impact analyses from such sources (FLAG 2010).

For purposes of this analysis, it is assumed that no concrete batch plants would be located within 50 km of any Class I areas. Total emissions from a concrete batch plant more than 50 km from any Class I areas added to construction emissions in the immediate vicinity would total far less than 500 tpy and thus would result in a Q/D ratio of less than 10 and satisfy the screening criteria for all AQRVs.

Impacts on Ambient Ozone Levels

TransWest's Proposed Action is unlikely to cause or contribute to the formation of regional ozone at detectable levels due to the low level of emissions of potential ozone forming compounds, including NO_X and VOCs.

Operation Impacts

Routine line maintenance and repairs during operation of the transmission line would result in negligible air emissions.

Decommission Impacts

Decommissioning of the transmission line would require removal of buildings and other infrastructure and would take place over a shorter period of time compared to construction. As a result, air emissions during decommissioning would be less than construction emissions, which are not expected to cause state or federal air quality standards to be exceeded.

3.1.6.1 Impacts from Terminal Construction and Operation

Terminals and Ground Electrode Sites

Particulate emissions from construction activities at the Northern and Southern terminals are shown in **Table 3.1-17**. Estimated criteria pollutant emission from construction activities at the Northern and Southern terminals are shown in **Table 3.1-18**. These values are representative regardless of the emission location; the proposed action would include terminals and ground electrode systems in Wyoming and Nevada, Design Option 2 would include terminals and ground electrode systems in Wyoming and Utah, and Design Option 3 would include facilities in Wyoming, Utah, and Nevada.

Table 3.1-17 Particulate Emissions from Construction of Northern and Southern Terminals and Ground Electrode Beds

Site	Initial Disturbance (acres)			PM_{10} Emissions (tons)			$PM_{2.5}$ Emissions (tons)		
	Site-specific	Corridor	Total	Site-specific	Corridor	Total	Site-specific	Corridor	Total
Northern Terminal Area	190.0	313.0	503.0	5.7	9.4	15.1	0.6	0.9	1.5
Southern Terminal Area	140.0	269.0	409.0	4.2	8.1	12.3	0.4	0.8	1.2
Northern Electrode Bed	160.0	90.0	250.0	4.8	2.7	7.5	0.5	0.3	0.8
Southern Electrode Bed	160.0	90.0	250.0	4.8	2.7	7.5	0.5	0.3	0.8

Calculations provided in **Appendix E**, **Tables E-9** and **E-10**.

Table 3.1-18 Mobile Source Emissions of Criteria Pollutants from Construction of Terminals and Ground Electrode Beds

Location	Pollutant (tons)					
	CO	NO_X	SO_2	VOC	PM_{10}	$PM_{2.5}$
Northern Terminal and Electrode Bed	0.63	2.94	0.19	0.23	0.21	0.21
Southern Terminal and Electrode Bed	1.14	5.29	0.35	0.42	0.38	0.38

Calculations provided in **Appendix E**, **Tables E-9** and **E-10**.

General Conformity Analysis for Clark County

The Southern Terminal would be located in Clark County, Nevada, under the proposed action or Design Option 3. Portions of Clark County, Nevada, are designated nonattainment or maintenance for one or more federally regulated pollutants. Portions of Clark County are either designated as nonattainment or maintenance for CO, PM_{10}, and ozone.

A federal agency must make a determination that permitting or approving an activity will conform to the state implementation plan in accordance with 40 CFR Part 93.150. A conformity determination is required for each pollutant when the total of direct and indirect emissions caused by a federal action in a non-attainment area would equal or exceed threshold quantities specified in 40 CFR Parts 93.153(b) (1) and (2). The applicable conformity thresholds for the Project area are as follows:

- NSR – 100 tons per year for nitrogen oxides, carbon monoxide, volatile organic compounds, sulfur oxides, and particulate matter with a diameter of less than 10 microns (NO_X, CO, VOC, SO_X, and PM_{10}, respectively).
- PSD – 250 tons per year for NO_X, CO, VOC, SO_X, and PM_{10}.
- Title V – 100 tons per year for NO_X, CO, VOC, SO_X, and PM_{10}.
- Conformity Thresholds – 100 tons per year for NO_X, CO, VOC, SO_X, and PM_{10}.

Since the project is predicted to emit all of these emissions (or precursors in the case of ozone), a conformity review was conducted based on USDOE guidance (USDOE 2000). To conduct the conformity review, the impact of the project ROW construction and facility maintenance activities was assessed in the nonattainment areas. The nonattainment area is a small subset of the whole project area. Emissions in the nonattainment area were calculated using the methodology described above for tailpipe emission and fugitive dust emissions, except calculations were limited to the nonattainment area. Estimated emissions were compared with the emissions threshold for conformity determinations as published by USDOE (2000).

Based upon the use of conservative emissions estimates, the emissions from the construction and operation of TWE in the Las Vegas nonattainment area as shown in **Tables 3.1-14** and **3.1-15** would be below the conformity thresholds; therefore, the Project is exempt from performing a comprehensive conformity analysis.

Key Parameter Summary

- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the northern terminal, substations, and ground electrode facilities would not cause state or federal air quality standards to be exceeded, based on a screening level air quality analysis.
- Based upon the use of conservative emissions estimates, the emissions from the construction and operation of TWE in the Las Vegas nonattainment area would be below the conformity

thresholds; therefore, the Project is exempt from performing a comprehensive conformity analysis.

- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the southern terminal would not cause state or federal air quality standards to be exceeded, based on a screening level air quality analysis.

Mitigation

No additional mitigation measures beyond the BMPs and Applicant Committed Design Features are anticipated for construction of the north and south terminal areas.

Operations

Routine vegetation maintenance, repairs and line maintenance during operation of the terminals would result in negligible air emissions.

Decommissioning

Decommissioning of the terminals would require removal of buildings and other infrastructure and would take place over a brief period of time. Air emissions during decommissioning would be less than construction emissions, and are not expected to cause state or federal air quality standards to be exceeded.

3.1.6.2 Impacts Common to All Alternative Routes and Associated Components

Air quality impacts from area sources during construction and operations of the transmission line are listed in **Table 3.1-19**. In general, area source impacts are caused by construction activities that disturb soils and release fugitive dust as well as tailpipe emissions from light pickups, heavy trucks, and construction equipment. Such impacts are transitory and temporary, and do not pose a threat to national or state AAQS. Alternative A is the shortest overall route and disturbs the fewest acres; therefore, it has less potential to impact air quality from area sources than the other alternatives. The point sources are portable concrete batch plants used to prepare material for tower foundations. Shorter transmission line routes would be expected to result in fewer towers requiring less concrete for tower bases, but only if the terrain and underlying soil structures are similar. Nevertheless, there is no appreciable difference in air quality impacts from point sources between the alternatives in each of the regions.

Table 3.1-19 Fugitive Dust Emissions from Construction by Region and Alternative

Region	PM_{10} (tpy)						$PM_{2.5}$ (tpy)					
	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
I	119.2	121.2	143.1	130.6	NA	NA	11.9	12.1	14.3	13.1	NA	NA
II	205.6	272.4	282.4	210.2	212.9	211.0	20.6	27.2	28.2	21.0	21.3	21.1
III	119.4	117.1	128.7	NA	NA	NA	11.9	11.7	12.9	NA	NA	NA
IV	44.4	47.2	49.4	NA	NA	NA	4.4	4.7	4.9	NA	NA	NA
Total	488.5	557.8	603.6	340.9	212.9	211.0	48.9	55.8	60.4	34.1	21.3	21.1

Calculations provided in **Appendix E**, **Table E-2**.

Discrepancies in totals due to rounding error.

Mitigation

No additional mitigation measures beyond the BMPs and Applicant Committed Design Features are anticipated for construction in Region I.

***AQ-1**: In Region II, the Alternative B transmission line route passes within about 10 miles of Arches National Park. No concrete batch plants would be located within 30 miles of Arches National Park; therefore, concrete required for structure foundations should be acquired from local sources in the vicinity of Moab.*

Effectiveness: Location of batch plants at 30 miles or more from Class I boundaries would avoid project contributions to air quality related value reductions in these Class I areas.

***AQ-2**: In Region III, the Proposed Action (Alternative A) passes within about 20 miles of Zion National Park. No concrete batch plants would be located within 30 miles of Zion National Park; therefore, concrete required for structure foundations should be acquired from local sources in the vicinity of Cedar City or St. George, Utah.*

Effectiveness: Location of batch plants at 30 miles or more from Class I boundaries would avoid project contributions to air quality related value reductions in these Class I areas.

***AQ-3**: The Clark County nonattainment area is located in both Region III and Region IV. No new concrete batch plants are to be located within the nonattainment area; concrete required for structure foundations and other construction are to be acquired from existing local vendors.*

Effectiveness: Use of local concrete sources would avoid project contributions to nonattainment conditions in the Las Vegas region.

Key Parameter Summary and Conclusion

The following statements are derived from the analysis presented for various air quality factors. At the present time, there is no known phase or activity proposed to be conducted during the Project that is not consistent with current air quality regulations in Wyoming, Colorado, Utah, or Nevada.

Neither the construction nor operations phase of the proposed action or alternatives is expected to:

- Cause or contribute to any violation of any state or federal ambient air quality standard;
- Interfere with the maintenance or attainment of any state or federal ambient air quality standard in the analysis area;
- Increase the frequency or severity of any existing violations of any state or federal ambient air quality standard in the analysis area;
- Delay the timely attainment of any standard, interim emission reduction, or other air quality milestone promulgated by the USEPA or state air quality agency;
- Cause any adverse impacts to AQRVs;
- Cause any adverse impact to AQRVs in a federal Class I area; or
- Exceed state or federal general conformity thresholds.

Construction GHG emissions are expected to be both temporary and negligible when compared to the preliminary statewide GHG inventories. Operations GHG emissions would be negligible.

Estimated project emissions for point sources and areas sources for the proposed project including the alternatives and alternative variations in each of the regions are listed in more detail in **Appendix E**.

3.1.6.3 Residual Impacts

There would be no residual impacts to air quality from the proposed project because reclamation and revegetation would stabilize exposed soil and control fugitive dust emissions. As vegetation becomes established, particulate levels would return to typical conditions of the surrounding environment.

3.1.6.4 Impacts to Air from the No Action Alternative

There would be no project specific air quality impacts from the No Action Alternative since there would be no project sources of emissions. No action would mean that valuable renewable resources would not be tapped to replace power generation from fossil fuel-fired generation facilities, and GHG emissions on the order of 12 million tons of CO_2e per year would potentially not be avoided.

3.1.6.5 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible impacts to air quality. However, there would be an irretrievable localized impact to air quality from fugitive dust emissions and equipment emissions during construction and before reclamation and revegetation is completed.

3.1.6.6 Relationship Between Local Short-term Uses and Long-term Productivity

The short-term uses associated with project construction and installation and would not substantively impact the long-term air quality in the analysis area.

3.2 Geological, Paleontological, and Mineral Resources

The proposed project covers several physiographic provinces including the Wyoming Basins, Colorado Plateau, Middle Rocky Mountains, and Basin and Range provinces. The proposed routes cross a variety of bedrock and surficial deposits that also include geologic hazards. Mineral resources in the areas crossed by the proposed Project include oil and natural gas, coal, aggregate and industrial minerals.

3.2.1 Regulatory Background

3.2.1.1 Geological Resources

Regulations pertaining to geological resources are concerned with the preservation of unique geological features. The National Registry of Natural Landmarks (16 USC 461-467) set up the National Natural Landmarks (NNL) program in 1962 and is administered under the Historic Sites Act of 1935. Implementing regulations were first published in 1980 under 36 CFR 1212 and the program was re-designated as 36 CFR 62 in 1981. A National Natural Landmark is defined as:

- An area designated by the Secretary of the Interior as being of national significance to the United States because it is an outstanding example(s) of major biological and geological features found within the boundaries of the United States or its Territories or on the Outer Continental Shelf (36 CFR 62.2).
- An area designated as one of the best examples of a biological community or geological feature within a natural region of the United States, including terrestrial communities, landforms, geological features and processes, habitats of native plant and animal species, or fossil evidence of the development of life (36 CFR 62.2).

<u>Geological Hazards</u>

Various federal and state regulations provide design standards for facilities located in areas that may have potentially damaging ground movements due to movement on active or potentially active faults, or landslides.

3.2.1.2 Paleontological Resources

Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (P.L. 59-209; 16 U.S.C. 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federally administered lands. Federal protection for scientifically important paleontological resources would apply to construction or other related project impacts that would occur on federally owned or managed lands. This act provides for funding of mitigation of paleontological resources discovered during federal aid highway projects, provided that “excavated objects and information are to be used for public purposes without private gain to any individual or organization.” In addition to the foregoing, the National Registry of Natural Landmarks provides protection to paleontological resources. The BLM manages paleontological resources (fossils) on federal lands under the following statutes and regulations (BLM 2012a):

- FLPMA (P.L. 94-579);
- NEPA (P.L. 91-190);
- Title 43 of the CFR (Public Lands:Interior) (addresses the collection of invertebrate, vertebrate and plant fossils); and
- The Paleontological Resources Preservation Act of 2009 (P.L.111-011). The law authorizes the BLM and USFS and other land management agencies of the federal government to manage and provide protection to fossil resources using “scientific principles and expertise.” The act defines

paleontological resource as "any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth."

In addition to the statutes and regulations listed above, fossils on public lands are managed according to internal BLM guidance and manuals. BLM Manual 8270 (BLM 1998a) and the BLM Handbook H-8270-1 (BLM 1998b) contain the BLM's policy and guidance for the management of paleontological resources on public land and information. The manual presents information on the authorities and regulations related to paleontological resources. The handbook gives procedures for permit issuance, requirements for qualified applicants, and information on paleontology and planning. Important guidance for the protection of paleontological resources is contained in IM 2009-011 which provides guidelines for the assessment and mitigation of impacts to paleontological resources (BLM 2008a). Other IMs include WO-IM-2012 140 and 141 (BLM 2012a,b).

The USFS also manages paleontological resources, but under the NFMA and NEPA.

3.2.1.3 Mineral Resources

Federally-owned minerals in the public domain are classified into specific categories and these categories only apply to minerals in the federal mineral estate. Because most of the mineral estate in the project area is owned by the federal government, it is important to identify the mineral commodity classifications used by the BLM and the USFS. Within legal constraints, publicly-owned minerals are available for exploration, development, and production, while subject to existing regulations, standard terms and conditions, and stipulations. These categories are locatable minerals, leasable, and salable minerals. The classifications listed below are based on Acts passed by the U.S. Congress.

- Locatable minerals include precious and base metallic ores and nonmetallic minerals such as bentonite, gypsum, chemical grade limestone, and chemical grade silica sand. Uncommon varieties of sand, gravel, building stone, pumice, rock, and cinders also are managed as locatable minerals. Locatable minerals are acquired under the General Mining Law of 1872, as amended and the Surface Use and Occupancy Act of July 23, 1955 (American Geological Institute 1997).
- Leasable minerals are those minerals that are leased to individuals for exploration and development. The leasable minerals have been subdivided into two classes, fluid and solid. Fluid minerals include oil and gas, geothermal resources and associated by-products, oil shale, native asphalt, oil impregnated sands, and any other material in which oil is recoverable only by special treatment after the deposit is mined or quarried. Solid leasable minerals are specific minerals such as coal and phosphates. Leasable minerals are associated with the following laws; Mineral Leasing Act of 1920, as amended and supplemented, Mineral Leasing Act for Acquired Lands of 1947, as amended, and the Geothermal Steam Act of 1970, as amended (American Geological Institute 1997). Leasable minerals are acquired by applying to the federal government for a lease to explore and develop the minerals.
- Salable minerals are common mineral materials that include sand, gravel, roadbed, ballast, and common clay and are sold by contract with the federal government. These have been identified as all other minerals that were not designated as leasable or locatable. These minerals are regulated under the Mineral Material Act of July 23, 1947, as amended, and the Surface Use and Occupancy Act of July 23, 1955 (American Geological Institute 1997).

3.2.2 Data Sources

Data sources include published maps and reports and internet websites of the U.S. Geological Survey (USGS) and UGS. Other data sources included academic and professional journals and publications. Specific reference citations are provided within the text and a complete description of each reference is provided in reference section of the document.

3.2.3 Analysis Area

The analysis area for geology, minerals, and paleontological resources generally encompasses the area within the 2-mile transmission line corridor. However, the Baseline Description includes general descriptions of the physiography, geology, paleontological resources, and mineral resources of the regions where the alternatives are located in order to provide a sense of the geological setting.

3.2.4 Baseline Description

3.2.4.1 Physiography and Geology

The proposed project covers several physiographic provinces including the Wyoming Basins, Colorado Plateau, Middle Rocky Mountains, and Basin and Range (Fenneman 1928).

The Wyoming Basins province covers 40,000 square miles in much of central and southwestern Wyoming and a portion of northwestern Colorado (Howard and Williams 1972). The province is characterized by basins, small mountain ranges, plateaus, and mesas where elevations generally range from 6,000 to 7,000 feet above mean sea level (amsl) in the basins to more than 8,000 feet amsl elevation in the mountain ranges. The area is semi-arid and playas, deflation basins, sands dunes, and badlands are common features.

In the Wyoming Basins section, the bedrock formations generally consist of Upper Cretaceous and Lower Tertiary rocks. Surficial materials consist of recent and older quaternary alluvium, colluvium and terrace deposits. Also present are sand dunes, playa deposits, and landslide material. Various structural features are present in the Wyoming Basins, including (from east to west) the Hanna Basin, Rawlins Uplift, southeast Greater Green River Basin (including the Washakie and Sand Wash Basins), and the Axial Arch (Grose 1972). Among the major structural features are numerous smaller structural features including folds and faults.

The Colorado Plateau province is 140,000 square miles in area and covers portions of Utah, Colorado, Arizona, and New Mexico (Howard and Williams 1972). The plateau is semi-arid to arid and landforms typically consist of highly dissected plateaus and mesas and badland topography.

Within the Colorado Plateau province are the Uinta Basin, High Plateaus of Utah, and Canyonlands sections of the Colorado plateau province (Fenneman 1928). The Uinta Basin is a strong-relief, dissected plateau where elevations range from about 5,000 to 7,000 feet amsl. The High Plateaus of Utah section is characterized by elevated and dissected block plateaus and terrace plateaus covered in part by volcanic flows. The High Plateaus of Utah is a transition zone between the Colorado Plateau and the Basin and Range province to the west because the area has characteristics of both provinces (Utah Geological Survey [UGS] 2011a). The High Plateaus of Utah section is rugged and elevations range from about 7,000 to 10,000 feet amsl. The western portion of the Canyonlands section (west of the Green River) is characterized by eroded plateaus and high relief with elevations ranging from 5,000 to 7,000 amsl. From the Utah-Colorado state line to the Green River, elevations range from less than 4,300 amsl at the Green River to 5,000 amsl.

Bedrock in the Colorado Plateaus primarily consists of nearly-flat lying Cretaceous and Paleozoic rocks, but also includes Tertiary sedimentary rocks (in the Uinta Basin) and Tertiary and Quaternary volcanic rocks (UGS 2011a). Surficial deposits are not very extensive and primarily consist of alluvium, terraces, colluvium, and sand dunes. Major structural features include the Piceance Basin, Douglas Creek Arch, Uinta Basin, San Rafael Uplift, and the Wasatch Plateau. Within the larger structural features, there are smaller order structures including folds and faults.

The Middle Rocky Mountains province consists of mountain ranges of varying structural styles and origins (fault block, dissected volcanic plateau, shallow thrust sheets, or deep seated eroded anticlinal folds). The

eastern extension of the Middle Rocky Mountain province is the Uinta Mountains. The Uinta Mountains are a large, deep-seated, breached anticline that trends east-west. Elevations in the eastern Uinta Mountains range from around 8,000 feet amsl along the crest of the range to approximately 6,500 feet amsl on the Wyoming side. In the Uinta Basin elevations are approximately 5,000 feet amsl. The Wasatch Range, which is the southern extremity of the Middle Rocky Mountain province, is a block-faulted mountain range with Mount Nebo being the highest point in the range at 11,877 feet amsl.

The major rock types exposed in the Uinta Mountains consist of Precambrian metamorphic sedimentary rocks (Hintze 1988). In the southern Wasatch Mountains the rocks consist of Tertiary volcanic and Upper Cretaceous rocks as well as intrusive masses of Jurassic-aged salt and gypsum containing highly deformed Jurassic to Quaternary deposits (Witkind and Weiss 1991).

The Great Basin section of the Basin and Range province is characterized by narrow, block-faulted mountain ranges that generally have a north-south trend and are separated by basins or valleys. In low-relief valleys such as the Pahroc-Delamar Valley, Dry Lake Valley, Tule Desert, Escalante Desert, Muddy River Valley, and Las Vegas Valley, elevations range from about 6,000 feet amsl in central Utah to 2,000 feet amsl near Las Vegas, Nevada. Mountain ranges include the Cedar Range, the Delamar Mountains, the Clover Mountains, Bull Valley Mountains, and the Beaver Dam Mountains, where elevations approach 7,000 feet amsl.

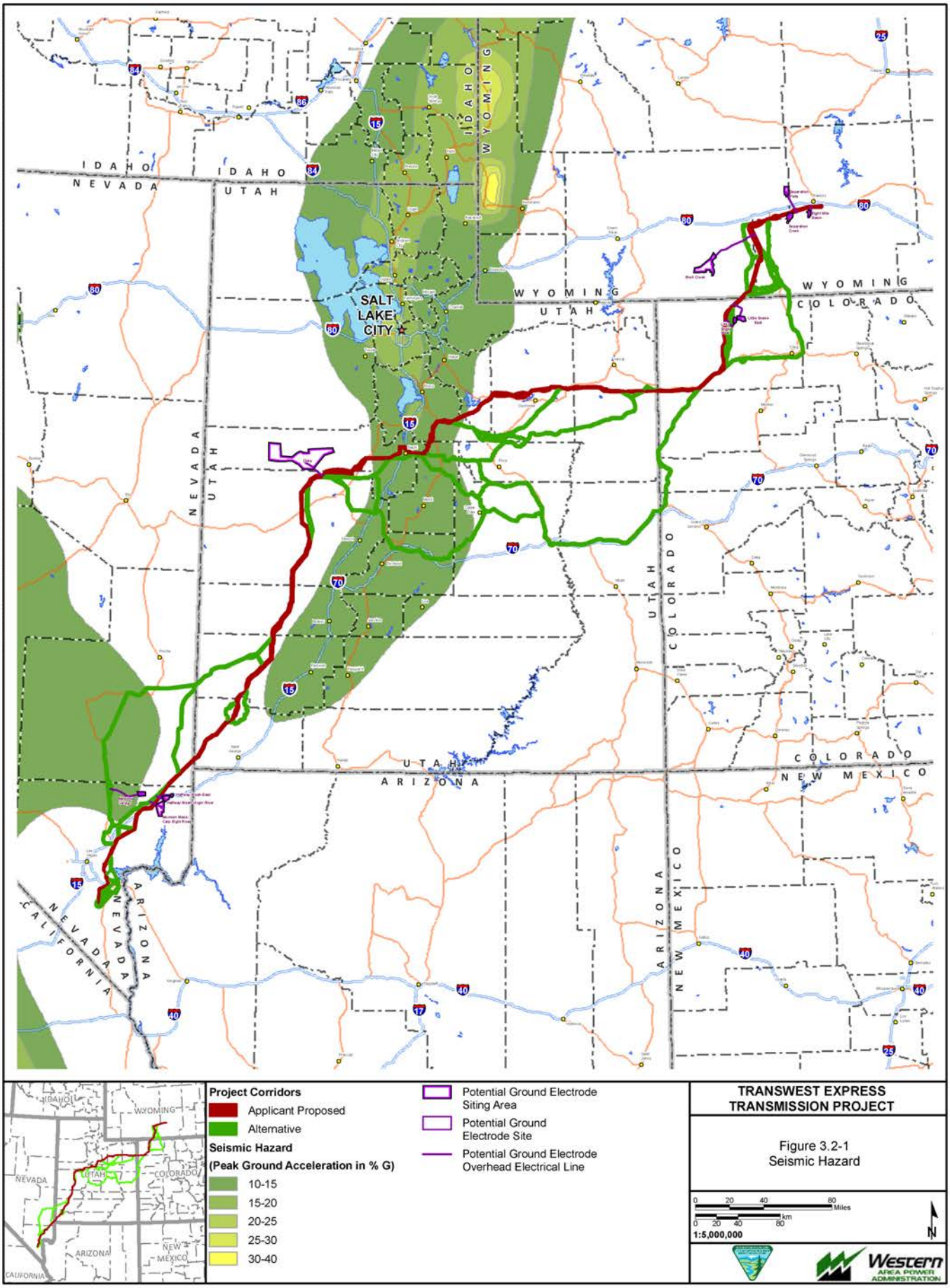
In the Great Basin, the alternatives cross primarily unconsolidated deposits of alluvium, alluvial fan, pediment, sand dune, lake sediments, and occasional outcrops of sedimentary Cambrian rocks (Hintze and Davis 2002; Hintze et al. 2003; Steven et al. 1990; Rowley et al. 2006). The alternatives also cross Tertiary volcanic lava flows and folded Mesozoic and Paleozoic rocks in southwest Utah. In the Nevada portion of the Great Basin, the alternatives cross Tertiary volcanic and sedimentary rocks, Precambrian rocks, Paleozoic limestone and dolomite, and Triassic sedimentary rocks (Tschanz and Pampeyan 1970; Longwell et al. 1965).

3.2.4.2 Geologic Hazards

Seismic Hazards

Seismic hazards occur as the result of energy that is released when there is movement on faults in the Earth's crust that results in an earthquake. Seismicity refers to the frequency of earthquakes which varies with geographic location. A fault is a fracture whereby the ground on either side of the fracture has moved relative to one another, and parallel to the fracture (USGS 2009a). An active fault is a fault on which movement has occurred within the last 10,000 years. A quaternary fault is a fault where evidence indicates that movement has taken place within the last 1.6 million years, but no evidence of movement within the last 10,000 years.

An earthquake generates waves of energy that cause the ground to shake, even many miles from the site of the fault rupture. The USGS develops estimates of potential ground motion using the peak acceleration of ground motion expressed as a percentage of the acceleration of gravity (**g**) with a 10 percent probability of exceedance in 50 years (Petersen et al. 2008). This information is presented in map form (**Figure 3.2-1**) to provide an indication of potential seismic risk for regions to be crossed by the alternatives. This figure shows that ground motion is expected to be low except along the seismically active area along the Wasatch Mountains and High Plateaus of Utah.



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Landslides

Landslide is a term used for various processes involving the movement of earth material down slopes (USGS 2004). Landslides can occur in a number of different ways in different geological settings. Large masses of earth become unstable and by gravity begin to move downhill. The instability can be caused by a combination of factors including steep slopes, periods of high precipitation, undermining support by natural processes (stream erosion), or unintentional undercutting or undermining the strength of unstable materials in the construction of roads and structures.

The degree of landslide hazard is defined on the basis of landslide incidence and degree of landslide susceptibility as determined by the USGS in (Radbruch-Hall et al. 1982). Geologic map units or portions of map units "with more than 15 percent of their area involved in landsliding were classified as having high incidence; those with 1.5 to 15 percent of their area involved in landsliding, as having medium incidence; and those with less than 1.5 percent of their area involved, as having low incidence." Landslide susceptibility has been defined as "the probable degree of response of the areal rocks and soils to natural or artificial cutting or loading of slopes or to anomalously high precipitation. High, medium, and low susceptibility are delimited by the same percentages used in classifying the incidence of landsliding" (i.e., high greater than 15 percent, medium 1.5 to 15 percent, and low, less than 1.5 percent). The project area contains, for the most part, areas of low landslide incidence and susceptibility, but there are areas of high susceptibility and incidence of landslides, especially in central Utah.

Subsidence

Subsidence is a decrease of surface elevation of the ground and may be caused by a variety of phenomena including, but not limited to, dissolution of subsurface strata, compaction, removal of groundwater, and earthquake ground motion. The surface expression from subsidence can range from localized precipitous collapses (sinkholes) to broad regional lowering of the earth's surface. Sinkholes have been identified in the North Horn Formation in the Wasatch Plateau area and the Scipio Valley (Bjorkland and Robinson 1968; Gillette and Miller 1999). Other causes of subsidence are underground mining and subsidence due to groundwater withdrawal. Subsidence due to coal mining may be a hazard in the coal resource and mining areas that are crossed. Subsidence due to groundwater withdrawal may be of greatest concern in southwestern Utah.

3.2.4.3 Paleontological Resources

The BLM has adopted the PFYC system to identify and classify fossil resources on federal lands (BLM 2007). Paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources. The alternatives cross bedrock that has the potential to contain valuable paleontological resources. The various geographic regions have formations that have yielded high value fossils, especially vertebrates such as dinosaurs and mammals. The formations also contain valuable invertebrate and plant fossils.

The PFYC system is a way of classifying geologic units based on the relative abundance of vertebrate fossils or scientifically significant fossils (plants, vertebrates, and invertebrates) and their sensitivity to adverse impacts. A higher class number indicates higher potential. The PFYC is not intended to be applied to specific paleontological localities or small areas within units. Although important localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment. The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis and should be used to assist in determining the need for further mitigation assessment or actions. The BLM intends for the PFYC system to be used as a

guideline as opposed to rigorous definitions. Descriptions of the potential fossil yield classes are summarized in **Table 3.2-1**.

Table 3.2-1 Potential Fossil Yield Classification

Class	Description	Basis	Management Considerations
1	Very low potential. Geologic units not likely to contain recognizable fossil remains. Rocks such as igneous or metamorphic units, (excluding reworked volcanic ash units) and units that are Precambrian in age or older.	The probability for impacting any fossils is negligible. Assessment or mitigation of paleontological resources is usually unnecessary. The occurrence of significant fossils is non-existent or extremely rare.	Management concern for paleontological resources in Class 1 units is usually negligible or not applicable. Assessment or mitigation is usually unnecessary except in very rare or isolated circumstances.
2	Low Potential. Sedimentary geologic units which are not likely to contain paleontological resources. Included in Class 2 are rock units or geologic deposits have the following characteristics: Vertebrate or significant invertebrate or plant fossils not present or very rare; units that are generally younger than 10,000 years before present; recent aeolian deposits; and sedimentary rocks that exhibit significant physical and chemical changes (i.e., diagenetic alteration).	The probability for impacting vertebrate fossils or paleontological resources is low. Assessment or mitigation of paleontological resources is not likely to be necessary. Localities containing important resources may exist, but would be rare and would not influence the classification. These important localities would be managed on a case-by-case basis.	Management concern for paleontological resources is generally low and assessment or mitigation is usually unnecessary except in rare or isolated circumstances.
3a, 3b	Moderate or Unknown Potential. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential. Class 3 units include the following types of geologic units: • Often marine in origin with sporadic known occurrences of vertebrate fossils. • Vertebrate fossils and scientifically important invertebrate or plant fossils known to occur intermittently; predictability known to be low. • Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance. **Class 3a** – Moderate Potential. Units are known to contain paleontological resources, but these occurrences are widely scattered. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.	This classification includes a broad range of paleontological potential. It includes geologic units of unknown potential, as well as units of moderate or infrequent occurrence of paleontological resources. Surface-disturbing activities may require field assessment to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources. These units may contain areas that would be appropriate to designate as hobby collection areas due to the higher occurrence of common fossils and a lower concern about affecting significant paleontological resources.	Management concern for paleontological resources is moderate or cannot be determined from existing data. Management considerations cover a broad range of options as well, and could include pre-disturbance surveys, monitoring, or avoidance. Surface-disturbing activities will require sufficient field assessment to determine appropriate course of action.

Table 3.2-1 Potential Fossil Yield Classification

Class	Description	Basis	Management Considerations
3a, 3b (continued)	**Class 3b** – Unknown Potential. Units exhibit geologic features and preservational conditions that suggest paleontological resources, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this Class may eventually be placed in another Class when sufficient survey and research is performed. The unknown potential of the units in this Class should be carefully considered when developing any mitigation or management actions.		
4a,b	High Potential. Geologic units containing a high occurrence of paleontological resources. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases. Class 4 units have the following characteristics: • Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted. • Areas of exposed outcrop are smaller than two contiguous acres. • Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions. • Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources. **Class 4a** – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may impact some areas.	The probability for impacting paleontological resources is moderate to high, and is dependent on the proposed action. Mitigation considerations must include assessment of the disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or increased ease of access resulting in greater looting potential. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.	Management concern for paleontological resources in Class 4 is moderate to high, depending on the proposed action. A field survey by a qualified paleontologist is often needed to assess local conditions. Management prescriptions for resource preservation and conservation through controlled access or special management designation should be considered. Class 4 and Class 5 units may be combined as Class 5 for broad applications, such as planning efforts or preliminary assessments, when geologic mapping at an appropriate scale is not available. Resource assessment, mitigation, and other management considerations are similar at this level of analysis, and impacts and alternatives can be addressed at a level appropriate to the application.

Table 3.2-1 Potential Fossil Yield Classification

Class	Description	Basis	Management Considerations
4a,b (continued)	**Class 4b** – These are areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.		
5a,b	Very High Potential. Highly fossiliferous geologic units that consistently and predictably produce paleontological resources, and that are at risk of human caused adverse impacts or natural degradation. Class 5 units have the following characteristics: • Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted. • Areas of exposed outcrop are smaller than two contiguous acres. • Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions. • Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources. **Class 5a** – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities. **Class 5b** – These are areas underlain by geologic units with very high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.	The probability for impacting significant fossils is high and fossils known or can reasonably be expected to occur in the impacted area. On-the ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.	Management concern for paleontological resources in Class 5 areas is high to very high. A field survey by a qualified paleontologist is usually necessary prior to surface disturbing activities or land tenure adjustments. Mitigation will often be necessary before and/or during these actions. Official designation of areas of avoidance, special interest, and concern may be appropriate.

Source: BLM 2007.

3.2.4.4 Mineral Resources

Mineral resources in the various regions include metallic ores (gold, silver, and copper), non-metallic deposits (sand, gravel, and gypsum), geothermal, coal, and hydrocarbons (oil and natural gas). The following subsections provide a summary of the mineral resources found in each region.

3.2.5 Regional Description

3.2.5.1 Region I

Physiography and Geology

Region I is primarily located in the Wyoming Basins and Colorado Plateau physiographic provinces; a small portion in Utah and Wyoming also crosses the Middle Rocky Mountain province (**Figure 3.2-2**) (Fenneman 1928).

In Wyoming, Region I is located in the Hanna Basin and the southeast portion of the Greater Green River Basin (within the Wyoming Basins physiographic area). The basins contain thousands of feet of sedimentary rocks and were created during the formation of the Rocky Mountains in late Cretaceous and early Tertiary time. Bedrock is composed of Triassic, Jurassic, Cretaceous and Tertiary rocks (Love and Christensen 1985). The Cretaceous units include the Niobrara, Steel Shale, Mesaverde, Lewis, and Lance formations. The Cretaceous rocks consist of marine shale, sandstones, mudstones, and minor coal beds (Watson 1980). Tertiary units crossed are the Fort Union, Ferris, and Hanna formations that consist of non-marine, continental, and fluvial (river) deposits of sandstone, conglomerate, mudstones, carbonaceous shales, and coal. South of Wamsutter, Wyoming, the bedrock consists of mainly Tertiary Fort Union, Wasatch, and Green River formations. In Colorado, the bedrock units are the Wasatch and Green River formations, the Mancos shale, Mesaverde, and Miocene Browns Park formations.

Geological Hazards

Seismic Hazards

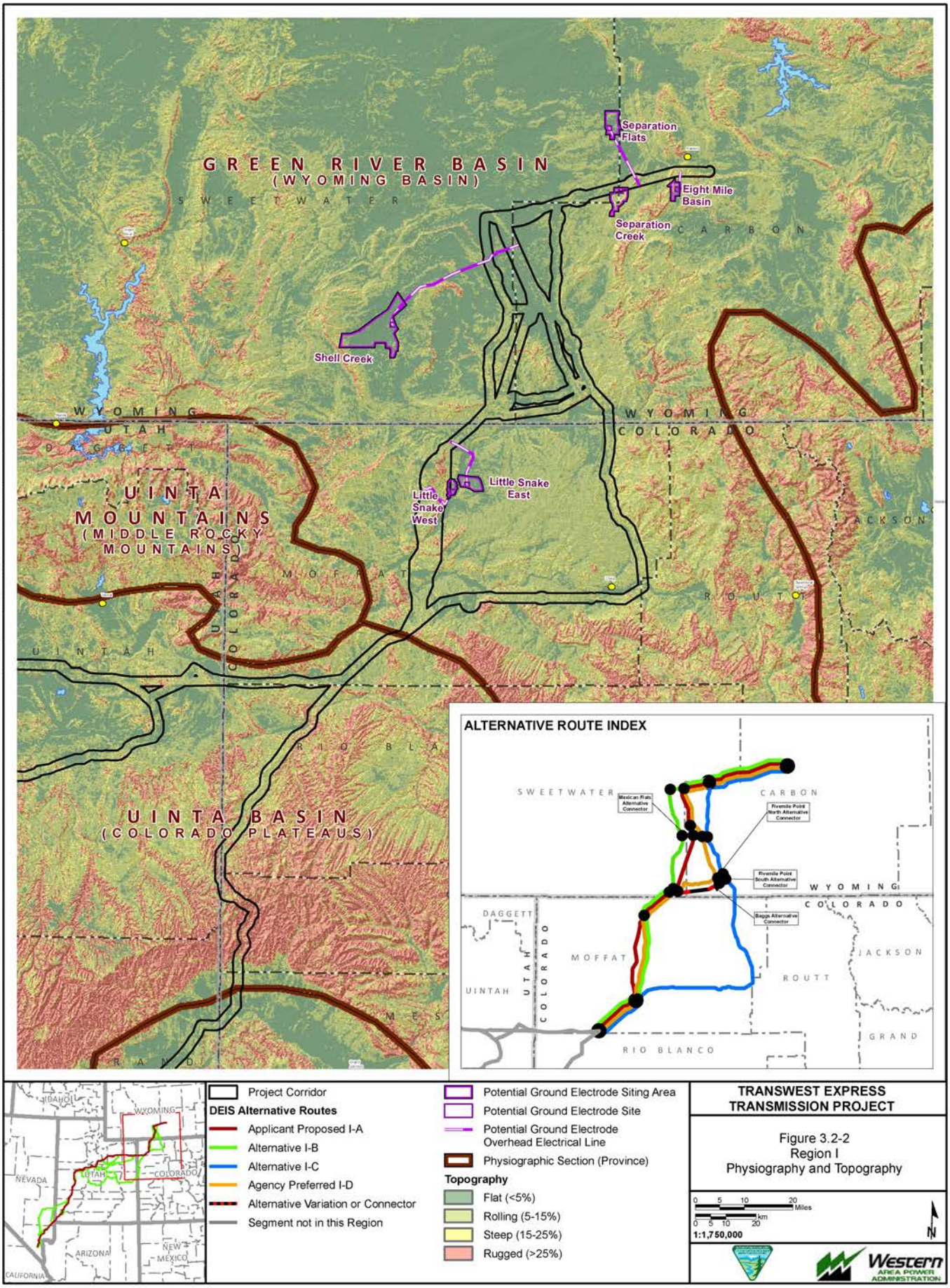
Region I is an area of low earthquake activity. There are no active faults in the Colorado and Wyoming portions of Region I and the routes in these states do not cross any quaternary faults (USGS 2006; USGS and Colorado Geological Survey 2006). The USGS seismic hazard mapping indicates that in areas crossed by the corridors in Region I, ground movement that could be triggered by a maximum credible earthquake is expected to be low, having a peak ground acceleration (PGA) of less than 10 percent of the acceleration of **g** with a 10 percent probability of exceeding that PGA in 50 years (Petersen et al. 2008).

Landslides

In Region I, there are areas of moderate to high susceptibility and low incidence in Wyoming and northwestern Colorado. **Figure 3.2-3** shows the landslide areas in Region I. The upper Cretaceous and Tertiary formations are particularly susceptible to movement and landslides.

Subsidence

Alternates cross areas of current and historic underground coal mining and these areas may be subject to ground subsidence. Specific areas crossed by the 2-mile transmission line corridors are discussed under the Mineral Resources topic for Region I.


GREEN RIVER BASIN
(WYOMING BASIN)
SWEETWATER
CARBON
Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
WYOMING
UTAH
DAGGETT
WYOMING
COLORADO
UINTA MOUNTAINS
(MIDDLE ROCKY MOUNTAINS)
Little Snake West
Little Snake East
JACKSON
MOFFAT
ROUTT
UINTAH
UTAH
COLORADO
RIO BLANCO
UINTA BASIN
(COLORADO PLATEAUS)
ALTERNATIVE ROUTE INDEX
SWEETWATER
CARBON
Mexican Flats Alternative Connector
Riverside Point North Alternative Connector
Riverside Point South Alternative Connector
Baggs Alternative Connector
WYOMING
COLORADO
DAGGETT
UTAH
COLORADO
MOFFAT
JACKSON
ROUTT
UINTAH
GRAND
RIO BLANCO
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Physiographic Section (Province)
Topography
Flat (<5%)
Rolling (5-15%)
Steep (15-25%)
Rugged (>25%)
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-2
Region I
Physiography and Topography
0 5 10 20 Miles
0 5 10 20 km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
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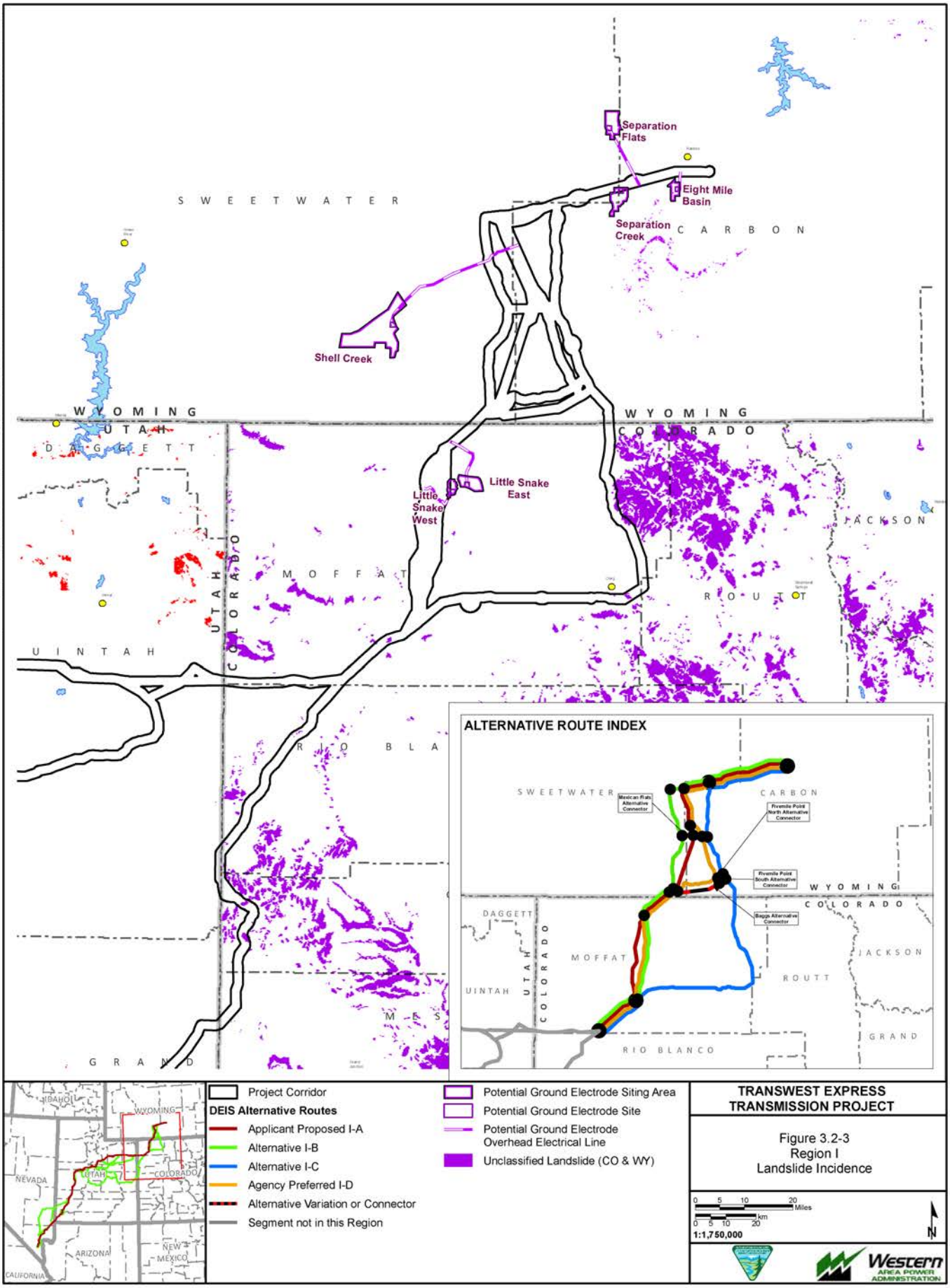
Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake East
Little Snake West
SWEETWATER
CARBON
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
ROUTT
JACKSON
UINTAH
RIO BLANCO
GRAND
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Fivemile Point South Alternative Connector
Baggs Alternative Connector
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Unclassified Landslide (CO & WY)
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-3
Region I
Landslide Incidence
Miles
km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
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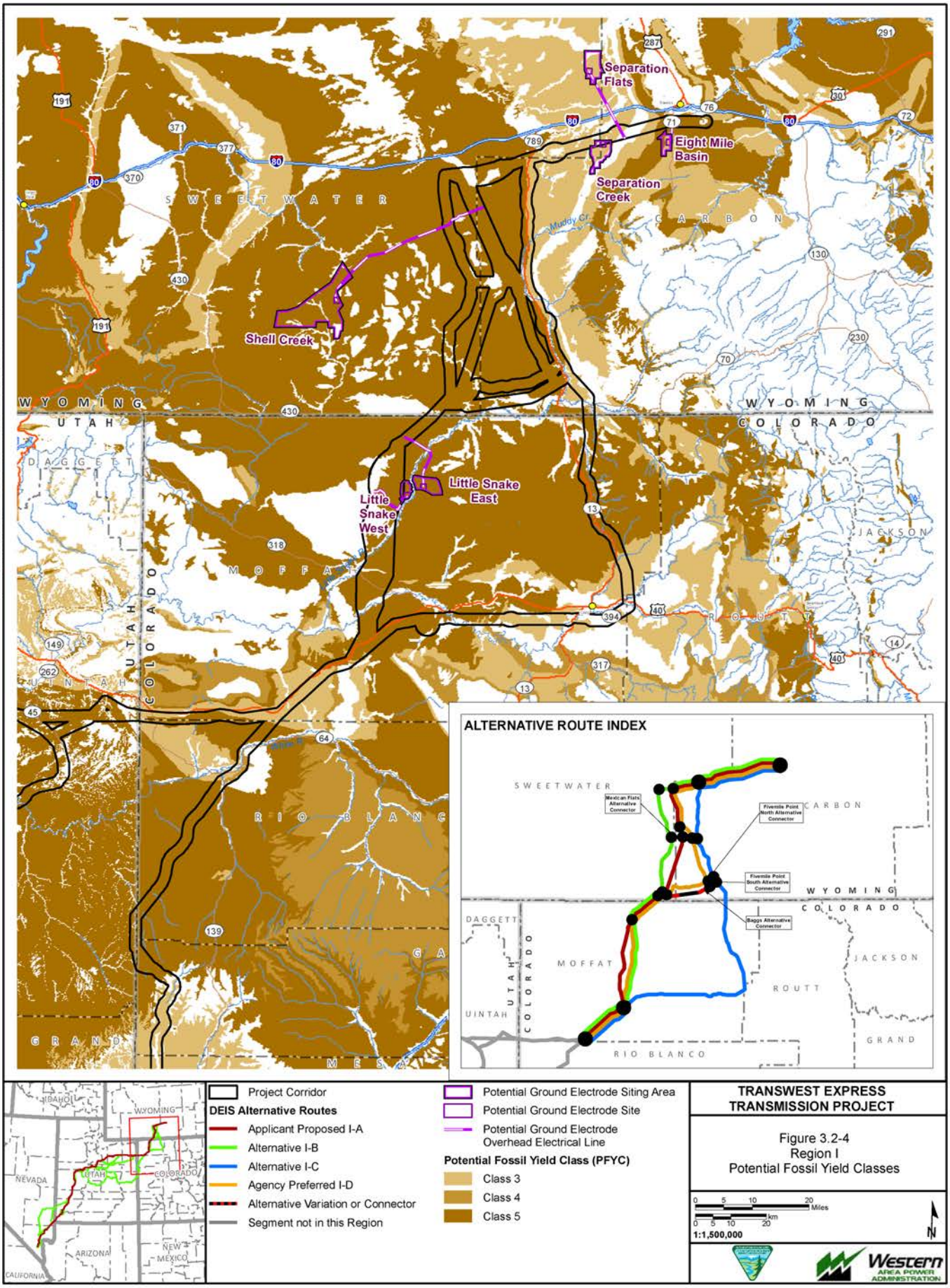
Paleontological Resources

In Region I, there are a number of important fossil bearing formations. **Table 3.2-2** lists the formations in order of relative age and provides the PFYC ratings for the formations or geologic units. **Figure 3.2-4** shows the PFYC ratings crossed in Region I. Dinosaur National Monument, an outstanding fossil resource, is located in Region I a few miles east of Vernal, Utah.

Table 3.2-2 Potential Fossil-bearing Formations and PFYC Classifications in Region I

Formation/Rock Unit	Age	PFYC Rank
Browns Park	Miocene to Pliocene	3-5
Bishop Conglomerate	Oligocene	3
Duchesne River	Eocene to Oligocene	5
Washakie Formation	Eocene	5
Battle Spring Formation	Eocene	3
Uinta Formation	Upper Eocene	4
Green River Formation and Parachute Creek and Douglas Creek Members	Eocene	4-5
Wasatch Formation	Lower Eocene	5
Hanna Formation	Lower Eocene	5
Fort Union	Paleocene	3
Ferris Formation	Paleocene	3-5
Medicine Bow Formation	Upper Cretaceous	3
Lance Formation	Upper Cretaceous	5
Lewis Shale	Upper Cretaceous	3
Williams Fork	Upper Cretaceous	5
Iles Formation	Upper Cretaceous	4
Mesaverde Group or Formation	Upper Cretaceous	3-5
Steele Shale	Upper Cretaceous	3
Niobrara Shale	Upper Cretaceous	5
Sego Sandstone of the Mancos Shale	Upper Cretaceous	3
Frontier Formation	Upper Cretaceous	3
Dakota Formation	Lower Cretaceous	5
Madison Formation	Devonian- Mississippian	3

Sources: BLM 2012b, 2008b; USDOE and USDOI 2008.


Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake East
Little Snake West
WYOMING
UTAH
COLORADO
SWEETWATER
CARBON
DAGGETT
MOFFAT
JACKSON
ROUTT
UINTAH
RIO BLANCO
GRAND
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Fivemile Point South Alternative Connector
Baggs Alternative Connector
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Potential Fossil Yield Class (PFYC)
Class 3
Class 4
Class 5
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-4
Region I
Potential Fossil Yield Classes
Miles
km
1:1,500,000
N
Western AREA POWER ADMINISTRATION
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Mineral Resources

The major mineral resources in the study area are oil, natural gas, and coal. The Green River Basin is a prolific area of natural gas production, but oil also is an important resource. The Uinta Basin also has a large resource of oil and natural gas. Coal bed methane is a potentially important resource in the region (BLM 2010). The analysis area crosses numerous oil and gas fields, especially in the Wyoming portion of the region (De Bruin 2007; Wray et al 2002). **Table 3.2-3** lists the oil and gas fields crossed by the proposed and alternative 2-mile transmission line corridors in Region I. Coal also is an important resource; portions of the Green River Coal Region are located within Region I. Alternative 2-mile transmission line corridors cross the following coal fields in Region I: Hanna, Kindt, Great Divide, Rock Springs, Yampa, and Lower White River (Biewick 2012; Carrol 2004; Tabet and Wakefield 2006). **Figure 3.2-5** depicts the oil and gas fields and coal mines in Region I.

Table 3.2-3 Oil and Gas Fields Crossed by Alternatives in Region I

Alternative I-A	State	Alternative I-B	State	Alternative I-C	State	Alternative I-D	State
Unnamed	Wyoming	Unnamed	Wyoming	Unnamed	Wyoming	Unnamed	Wyoming
Cont. Divide- Creston	Wyoming	Cont. Divide- Creston	Wyoming	Cont. Divide- Creston	Wyoming	Cont. Divide-Creston	Wyoming
Cedar Breaks	Wyoming	Fairway	Wyoming	Blue Gap	Wyoming	Cedar Breaks	Wyoming
Fireplace Rock	Wyoming	Mulligan Draw	Wyoming	Craig North	Colorado	Blue Gap	Wyoming
Round Table	Colorado	Dripping Rock	Wyoming	Buck Peak	Colorado	Round Table	Colorado
Powder Wash	Colorado	Cedar Breaks	Wyoming	Craig	Colorado	Powder Wash	Colorado
Elk Springs	Colorado	McPherson Springs	Wyoming	Bell Rock	Colorado	Elk Springs	Colorado
		Stateline	Wyoming	Elk Springs	Colorado		
		Stateline	Colorado				
		North Big Hole	Colorado				
		Big Hole	Colorado				
		Elk Springs	Colorado				

Sources: DeBruin 2007; Wray et al. 2002.

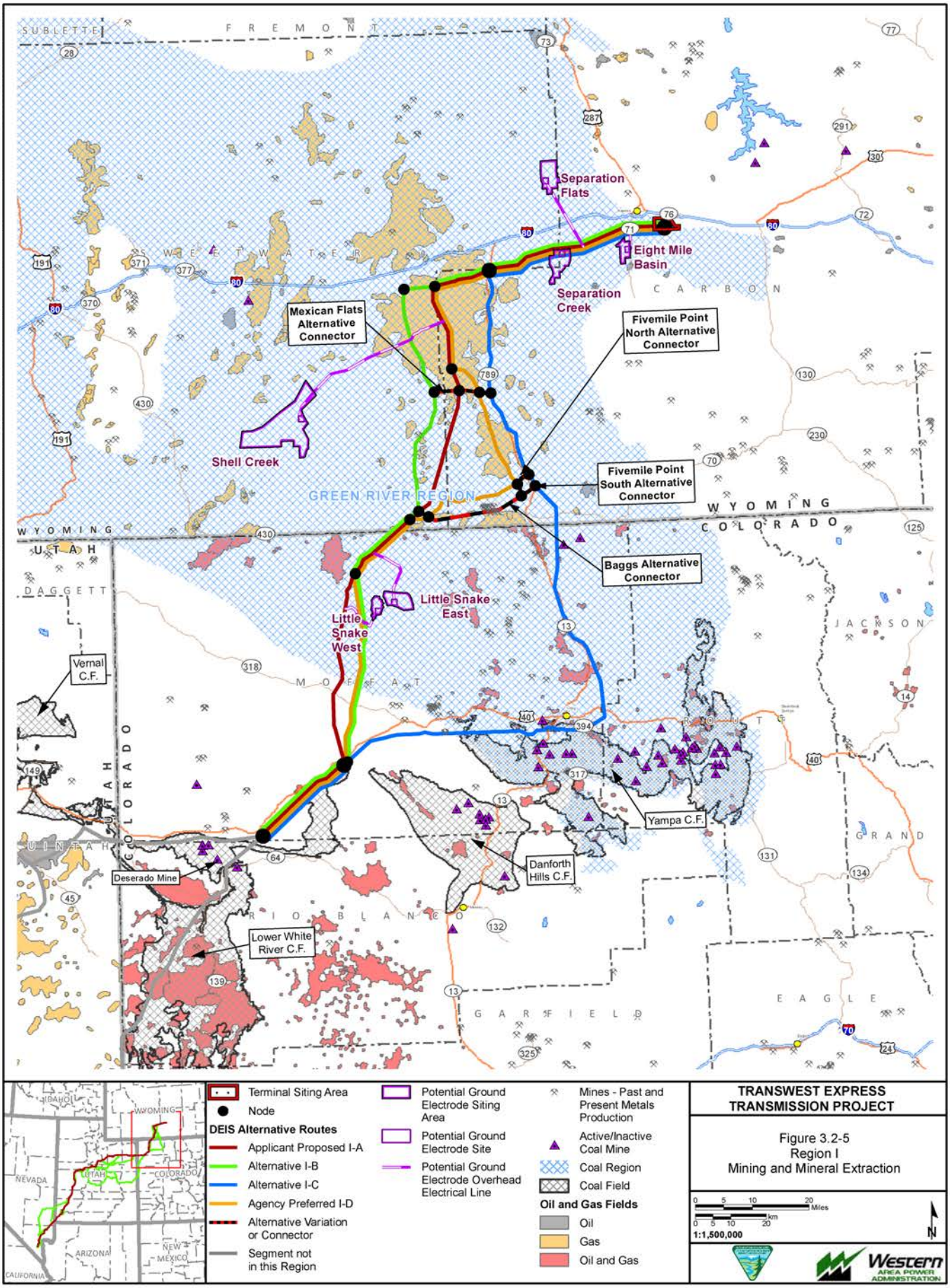
The Alternative I-C (Segment 190.00) 2-mile transmission corridor crosses a coal planning area and there are tracts in the Craig, Colorado, area that have been identified as suitable for coal leasing (BLM 1980). However, the corridor does not cross any of these potential coal lease tracts. The segment also crosses areas of abandoned coal mines located in Sections 9, 10, and 20 in Township 6 North, Range 90 West; and Section 9, Township 6 North, Range 91 west; 2 to 3 miles south and southwest of Craig, Colorado (Colorado Geological Survey 2011). There is subsidence associated with these historic abandoned coal mines.

Other mineral resources in Region I include oil shale and aggregate (sand, gravel, and crushed stone).

3.2.5.2 Region II

Physiography and Geology

Region II is located in the Colorado Plateau, Middle Rocky Mountains, and the Basin and Range provinces (**Figure 3.2-6**) (Fenneman 1928).


Separation Flats
Eight Mile Basin
Separation Creek
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Shell Creek
Fivemile Point South Alternative Connector
GREEN RIVER REGION
Baggs Alternative Connector
Little Snake East
Little Snake West
Vernal C.F.
Yampa C.F.
Danforth Hills C.F.
Deserado Mine
Lower White River C.F.
WYOMING
COLORADO
UTAH
SUBLETTE
FREMONT
SWEETWATER
CARBON
DAGGETT
MOFFAT
JACKSON
GRAND
EAGLE
GARFIELD
RIO BLANCO
UINTAH
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Mines - Past and Present Metals Production
Active/Inactive Coal Mine
Coal Region
Coal Field
Oil and Gas Fields
Oil
Gas
Oil and Gas
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-5
Region I
Mining and Mineral Extraction
1:1,500,000
Western AREA POWER ADMINISTRATION
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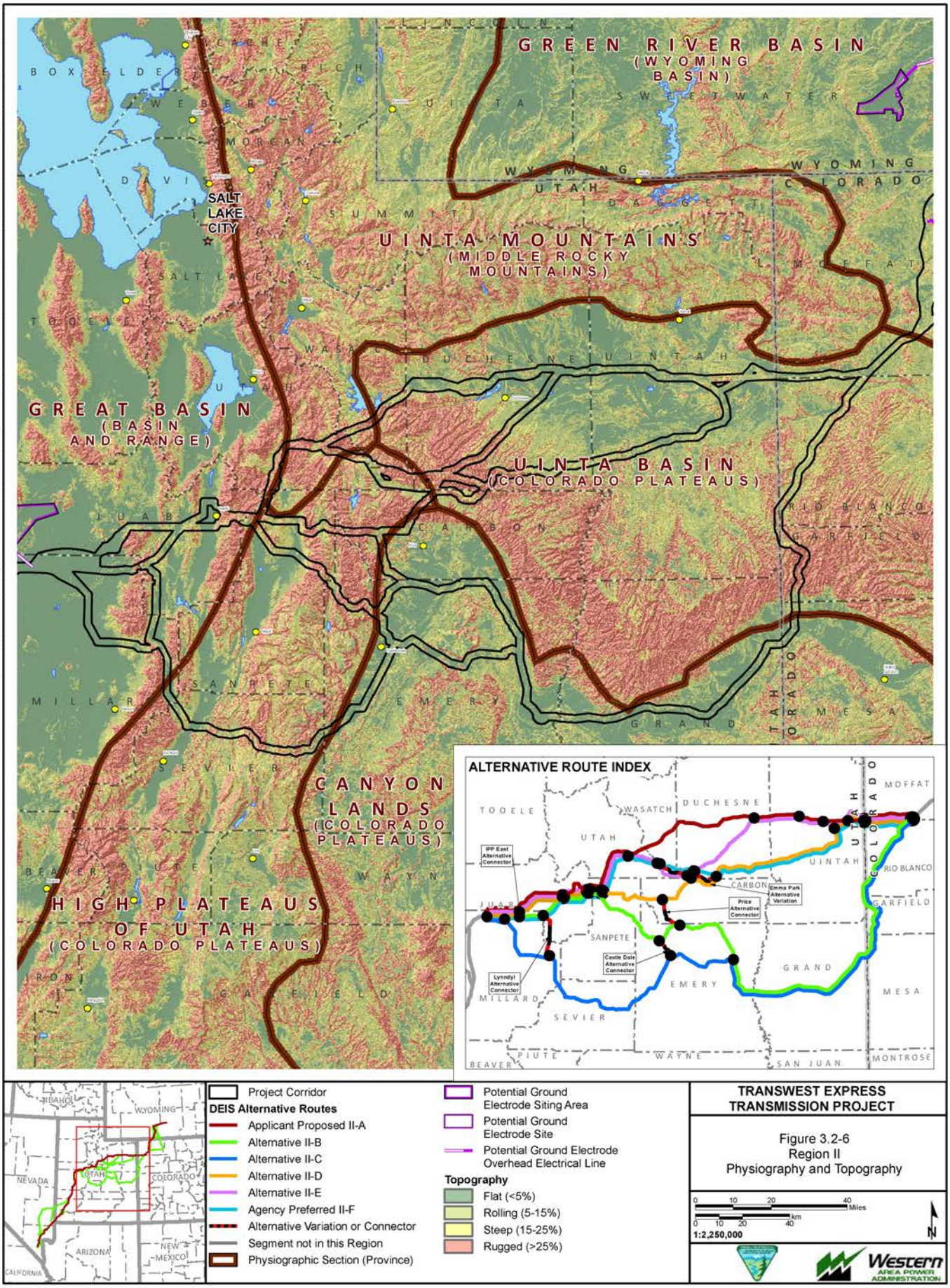
GREEN RIVER BASIN
(WYOMING BASIN)
UINTA MOUNTAINS
(MIDDLE ROCKY MOUNTAINS)
SALT LAKE CITY
GREAT BASIN
(BASIN AND RANGE)
UINTA BASIN
(COLORADO PLATEAUS)
CANYON LANDS
(COLORADO PLATEAUS)
HIGH PLATEAUS OF UTAH
(COLORADO PLATEAUS)
ALTERNATIVE ROUTE INDEX
IPP East Alternative Connector
Emma Park Alternative Variation
Price Alternative Connector
Castle Dale Alternative Connector
Lynndyl Alternative Connector
Project Corridor
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
Physiographic Section (Province)
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Topography
Flat (<5%)
Rolling (5-15%)
Steep (15-25%)
Rugged (>25%)
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-6
Region II
Physiography and Topography
1:2,250,000
Western AREA POWER ADMINISTRATION
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In Region II, the alternative 2-mile transmission line corridors cross bedrock mainly composed of Cretaceous and Tertiary-age rocks, but also cross older Mesozoic and Paleozoic rocks in the western portions of the region. The major structural elements crossed include the Piceance Basin, Douglas Creek Arch, Uinta Basin, San Rafael Uplift, Wasatch Plateau, and the Sevier Orogenic Belt (Grose 1972).

The alternative 2-mile transmission line corridors II-A, II-D, II-E, and II-F cross Mesaverde equivalents in Colorado. After entering Utah, the 2-mile transmission line corridors cross Wasatch, Green River, and Duchesne formations (Sprinkle 2007). The Duchesne, Uinta, and Green River formations are crossed to west of the Wasatch-Utah County line (Bryant 1992; Constenius et al. 2006). On the Wasatch Plateau, alternative 2-mile transmission line corridors cross the North Horn, Flagstaff Limestone, Moroni, and Park City formations. Region II also contains coalesced alluvial fan and alluvial deposits.

Near IPP, the 2-mile transmission line corridor alternatives primarily cross alluvium, alluvial fan, sand dunes, and lake deposits. The Prospect Mountain Quartzite, Dome Limestone, and Fish Haven Dolomite also are crossed.

Along the Colorado-Utah border, the alternative 2-mile transmission line corridors II-B and II-C cross the Mancos Shale, Mesaverde, and Mesaverde equivalents (Cashion 1973). The 2-mile transmission line corridors also cross Wasatch and Green River formations. In west-central Utah, the 2-mile transmission line corridors cross Mancos Shale, other upper Cretaceous units, and limited exposures of the Morrison formation until crossing the Green River (Williams 1964). West of the Green River, the 2-mile transmission line corridors cross the Navajo Sandstone, Carmel formation, Morrison formation, Dakota Sandstone, and Mancos shale. Also crossed in central Utah is the Arapian Shale (Williams and Hackman 1971; Hintze and Davis 2002).

Geological Hazards

Seismic Hazards

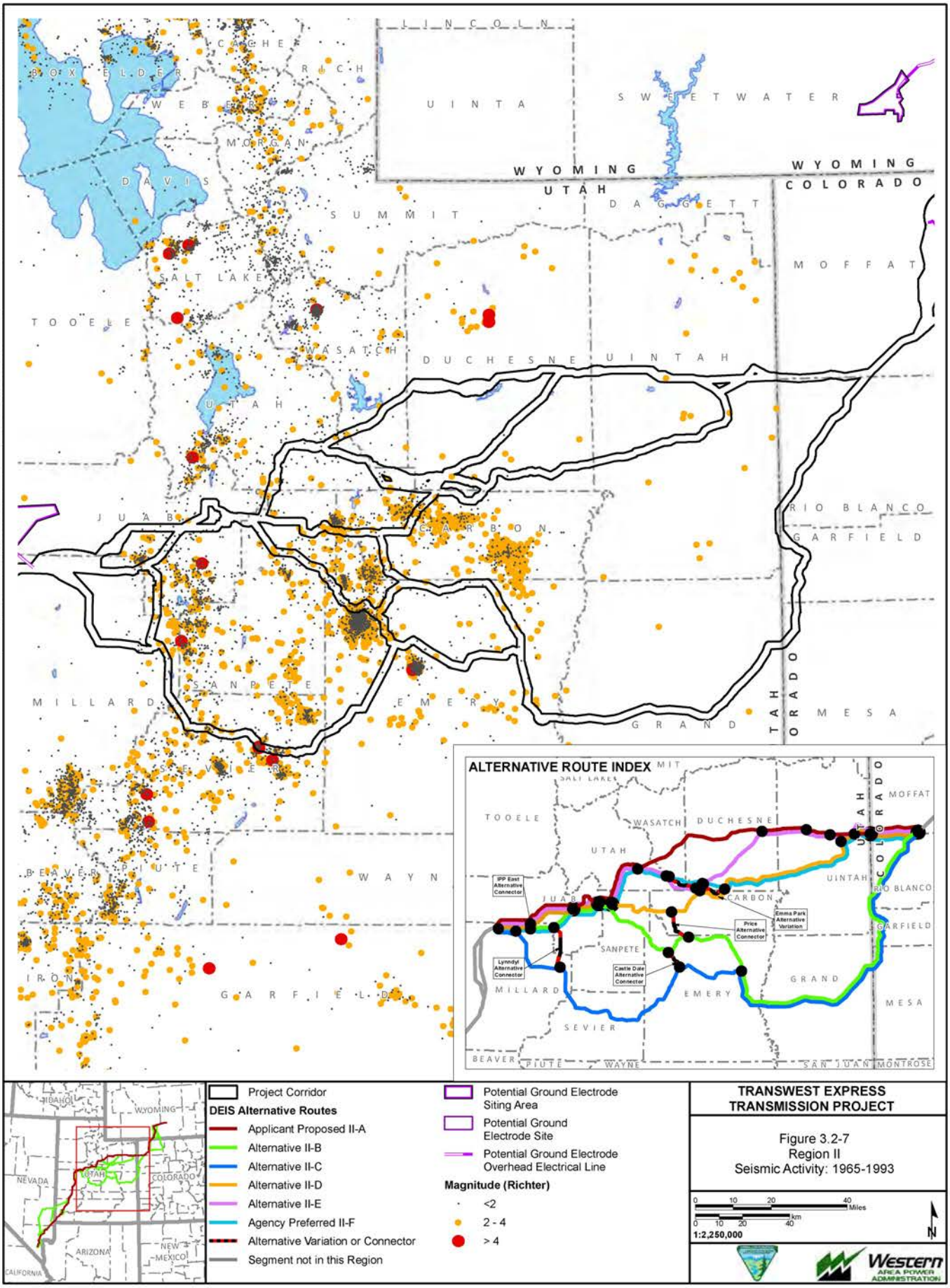
Seismic activity in Utah occurs along a line that stretches north to south in the central part of the state from the Salt Lake area and south, then southwest to the southwest corner of the state (**Figure 3.2-7**). The line corresponds to the Wasatch Mountains in the northern part of the state and along the hingeline that marks the boundary between the Great Basin and Colorado Plateau. This area of earthquake activity along the Wasatch Mountains and the hingeline that divides the state is referred to as the Intermountain Seismic Belt (Machette et al. 2004).

Region II contains a number of potentially active fault zones and includes Stinking Springs, Wasatch, Joes Valley, Little Valley, Scipio Valley, Sugarville, Pavant Range, and Maple Grove fault zones (USGS and UGS 2006).

Except for areas along the Intermountain Seismic Belt, ground motion hazard mapping indicates that there is a low potential for ground motion to cause serious damage from a maximum earthquake that could be predicted for the area (**Figure 3.2-1**). However, in the southern Wasatch Mountains, ground motion could damage vulnerable buildings (Christenson 1994).

Landslides

Along the High Plateaus of Utah, the alternative 2-mile transmission line corridors cross areas of moderate to high incidence and susceptibility to landslides (Radbruch-Hall et al. 1982; Giraud et al. 2007). **Figure 3.2-8** shows the landslide incidence in Region II. The North Horn, Green River, and Duchesne formations are primarily responsible for the slope instability in this area, but other formations may be involved too, especially Cretaceous rocks with numerous bentonite clay layers that can become unstable during periods of high precipitation. All alternative 2-mile transmission line corridors cross areas of high landslide incidence and potential.



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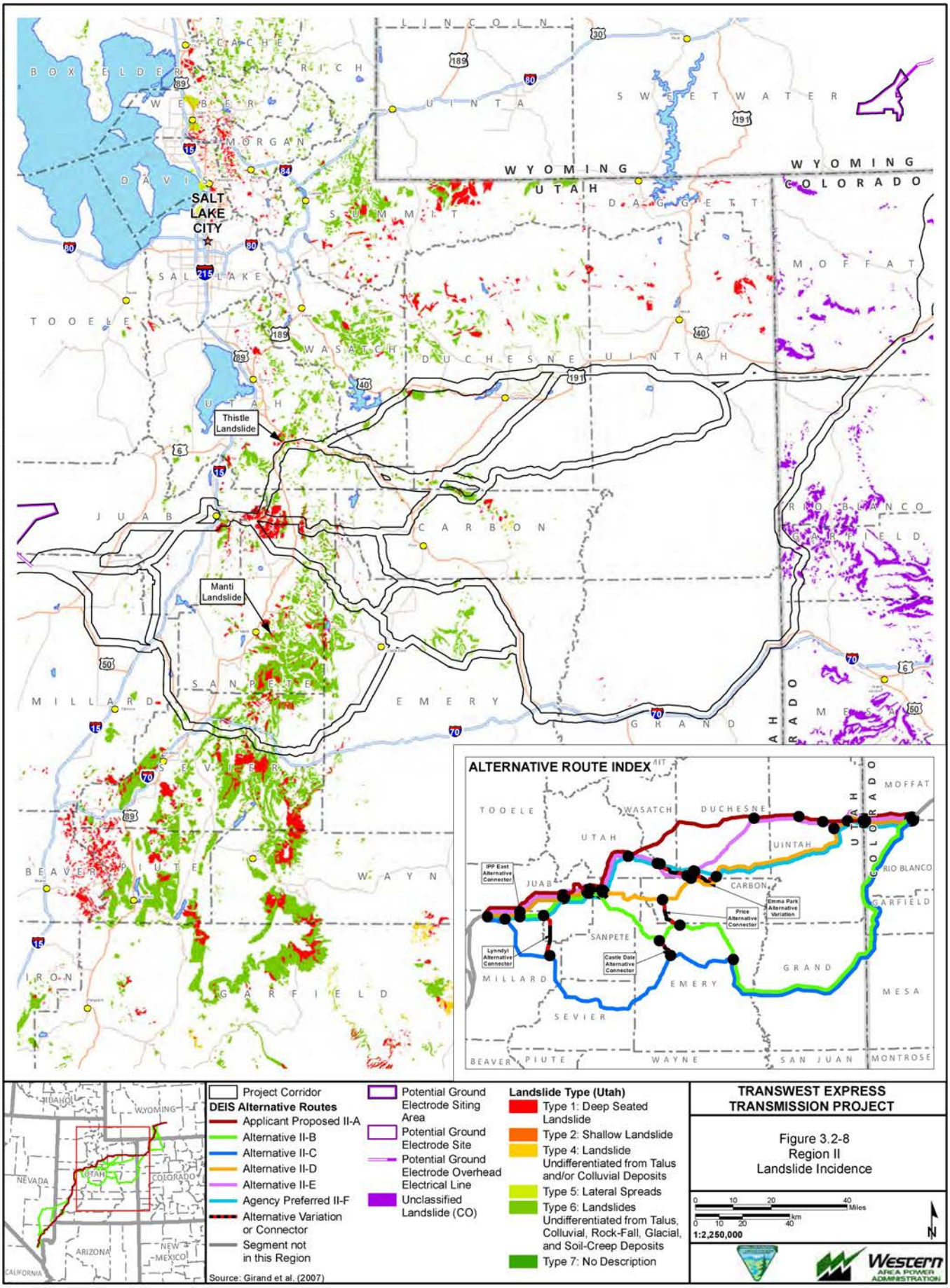

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Subsidence

The analysis area within Region II crosses areas underlain by carbonate or evaporite rocks and sinkholes have been identified in the North Horn Formation on the Wasatch Plateau and Scipio Valley in central Utah (Bjorkland and Robinson 1968; Gillette and Miller 1999). Alternate 2-mile transmission line corridors do, however, cross areas of current and historic underground coal mining and these areas may be subject to ground subsidence. Specific areas crossed by 2-mile transmission line corridors are discussed under the Mineral Resources topic for Region II.

Paleontological Resources

The alternative 2-mile transmission line corridors in Region II cross a number of important fossil bearing formations. **Table 3.2-4** lists the formations in order of relative age and provides the PFYC ratings for the formations or geologic units. **Figure 3.2-9** shows the PFYC ratings crossed in Region II. Formations in Region II have the potential to have world-class fossil resources as demonstrated by the Cleveland-Lloyd Dinosaur Quarry National Landmark located 20 miles east of Huntington, Utah (BLM 2009). Where alternative 2-mile transmission line corridors cross from the Wasatch Plateau to the lake beds of ancient Lake Bonneville, there is a potential to cross old shore lines left by fluctuations of lake levels during the Pleistocene (1.8 million to 10,000 years ago). Although, sand and gravel deposits associated with old lake shorelines may have fossil resources, the shoreline deposits have a PFYC ranking of 2 (BLM 2008c).

Table 3.2-4 Potential Fossil-bearing Formations and PFYC Classifications in Region II

Formation/Rock Unit	Age	PFYC Rank
Lake Bonneville Shoreline Deposits	Pleistocene	2
Duchesne River	Eocene to Oligocene	5
Uinta Formation	Eocene	5
Green River Formation, Douglas Creek and Parachute Creek members	Middle to Lower Eocene	5
Wasatch Formation	Lower Eocene	5
Flagstaff Limestone	Paleocene	5
North Horn	U. Cretaceous-L. Tertiary	5
Mesaverde Group or Formation[1]	Upper Cretaceous	3-5
Farrer Formation	U. Cretaceous	4-5
Neslen Formation	U. Cretaceous	4-5
Tuscher Formation	Cretaceous	3
Mancos Shale	Upper Cretaceous	3
Indianola Group	Cretaceous	3
Dakota Sandstone	Lower Cretaceous	3
Cedar Mountain	Lower Cretaceous	5
Morrison Formation	Jurassic	5
Carmel Formation	Jurassic	3
Curtis Formation	Jurassic	3
Navajo Sandstone	Jurassic	3
Kayenta	Jurassic	3-5
Chinle Formation	Upper Triassic	4
Moenkopi	Middle to Lower Triassic	3
Kaibab	Permian	3
White Rim Sandstone	Permian	3
Cutler Formation (Cedar Mesa Member)	Lower Permian	3

Table 3.2-4 Potential Fossil-bearing Formations and PFYC Classifications in Region II

Formation/Rock Unit	Age	PFYC Rank
Hermosa Group	Pennsylvanian	3
Humbug Formation	Mississippian	2
Deseret Formation	Mississippian	2
Wheeler Formation	Cambrian	Not determined (ND)
Swasy Limestone	Cambrian	ND
Whirlwind Formation	Cambrian	ND
Dome Limestone	Cambrian	ND
Chisholm Formation	Cambrian	ND
Howell Limestone	Cambrian	ND
Pioche Formation	Cambrian	ND

[1] Includes Price River Formation, Castlegate Sandstone, Blackhawk Formation, Star Point Sandstone.

Sources: BLM 2008d,e; USDOE and USDOI 2008; Western Trilobite Association.

Mineral Resources

The major mineral resources in Region II are oil, natural gas, coal, oil shale, and uranium. Numerous oil and gas fields of the Uinta Basin are within the Region II. **Figure 3.2-10** shows the oil and gas fields and coal mines in Region II. **Table 3.2-5** lists the oil and gas fields crossed by alternative 2-mile transmission line corridors in Region II. Coal is an important resource in Region II as well as coalbed methane.

In Utah, the Emery, Wasatch, and Book Cliffs coal fields are located in the region and coal is actively mined in several locations (UGS 1983; Chidsey et al. 2006; Bon and Wakefield 2008). The Book Cliffs form the southern boundary of the Uinta Basin and the Emery Coal Field is located in the east side of the Wasatch Plateau and the Wasatch coals field is collocated with the Wasatch Plateau. Both coal fields coincide with coal resources in upper Cretaceous rocks that outcrop along these features. Alternative II-D 2-mile transmission line corridor crosses active and inactive coal mining areas as well as potential coal development areas in the Book Cliffs and Wasatch coal fields in Carbon County, Utah (Township13 North, Ranges 6 through 10 East; BLM 2008d). Further south in the Wasatch coal field, Alternative II-B 2-mile transmission line corridor crosses active and historical coal mining areas and potential coal development areas northwest of Huntington, Utah (UGS 2012). The Alternative II-C 2-mile transmission line corridor encroaches on the east side of the Emery coal mine active permit area (Utah Division of Oil, Gas, and Mining [UDOGM] 2011).

In northwest Colorado, the Deserado Mine is located in the Lower White River coal field (Carroll 2004) (**Figure 3.2-5**). Alternatives II-A, II-D, II-E, and II-F 2-mile transmission line corridors cross just north of, and may slightly encroach on, areas proposed for leasing and expansion of the Deserado Mine in Township 3 North, Range 101 West (BLM 2011). Within the aforementioned corridors, there are historic coal mines northwest of the Deserado Mine in Township 3 North, Range 102 West (Carroll 2004). No information was available concerning whether subsidence has occurred or even if these are underground mines (Colorado Geological Survey 2011). Alternative II-B and II-C 2-mile transmission line corridors cross portions of the mine permit area of the Deserado Mine that have previously been mined in Township 2 North, Range 101 West. South of the Deserado Mine, the alternatives cross historic mining areas in Township 1 North, Ranges 101 and 102 West (Sullivan 1984).

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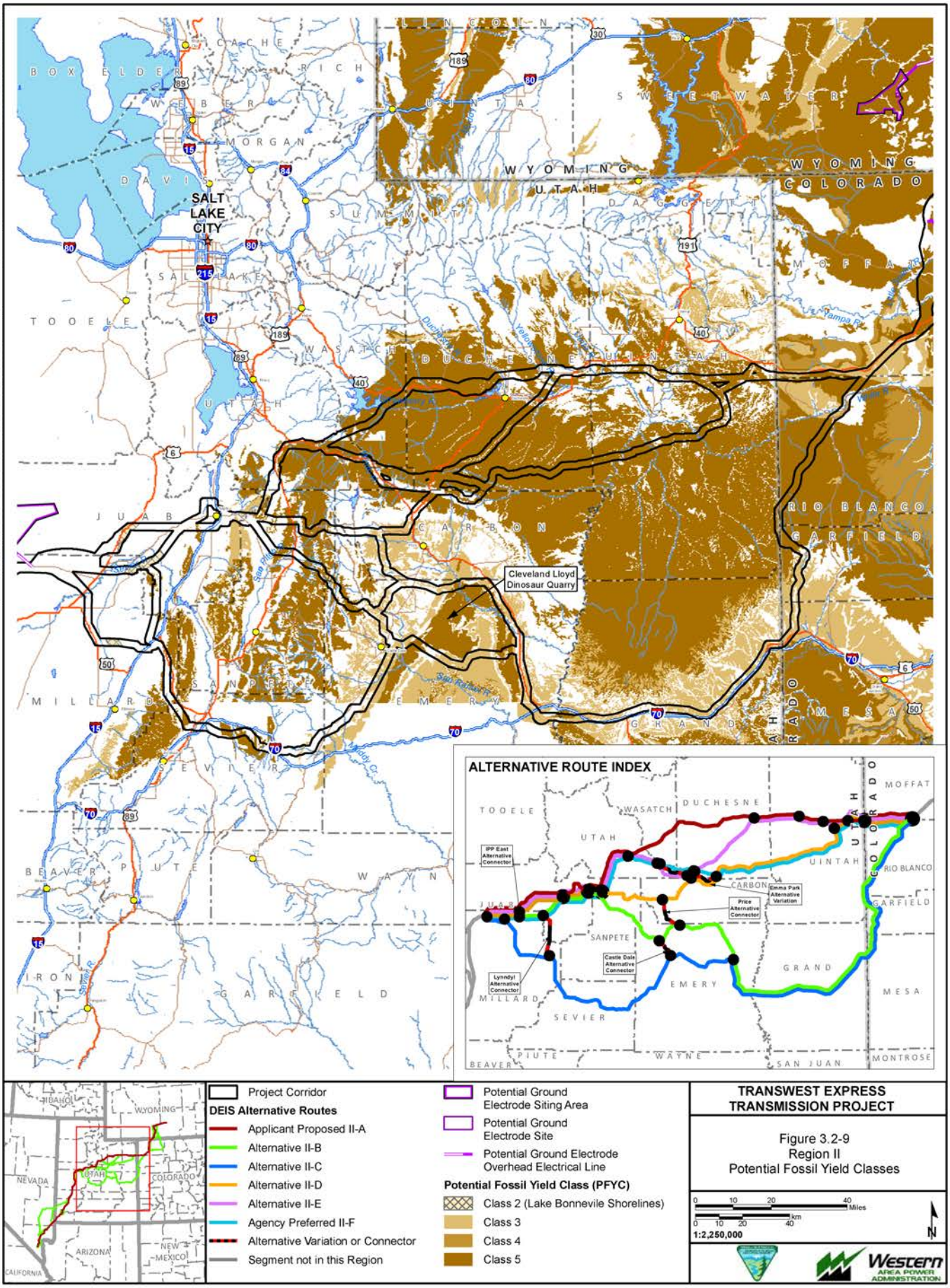


Exported On: 6/6/2013

Note: PFYC data is derived from digital geologic data as available and digitized from hard copy geologic maps as needed. Through a combination of these two methods, there is complete PFYC coverage of the TWE Project.

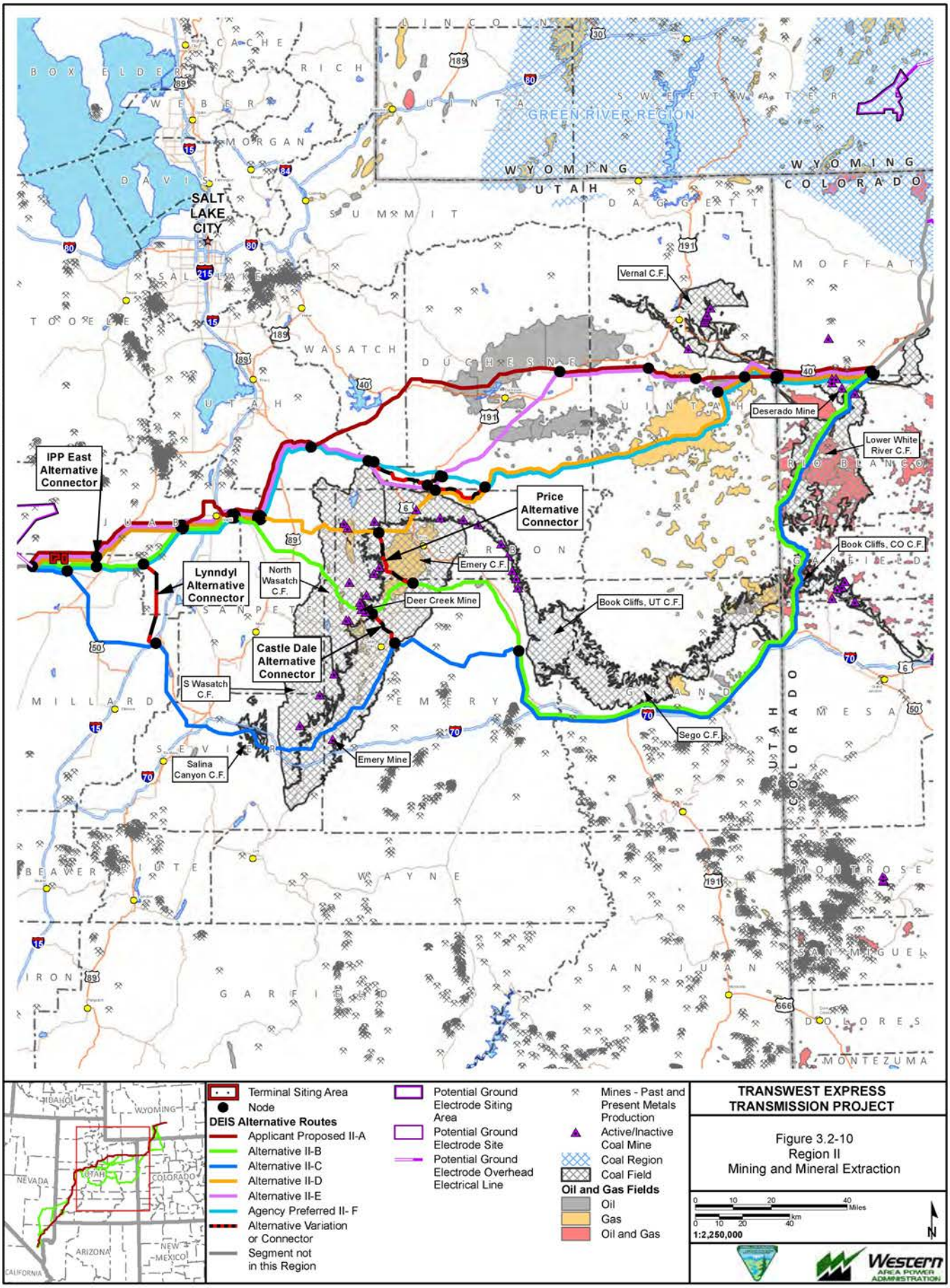

SALT LAKE CITY
GREEN RIVER REGION
WYOMING
UTAH
COLORADO
Vernal C.F.
Deserado Mine
Lower White River C.F.
Book Cliffs, CO C.F.
Price Alternative Connector
IPP East Alternative Connector
Lynndyl Alternative Connector
North Wasatch C.F.
Emery C.F.
Deer Creek Mine
Book Cliffs, UT C.F.
Castle Dale Alternative Connector
S Wasatch C.F.
Sego C.F.
Salina Canyon C.F.
Emery Mine
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II- F
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Mines - Past and Present Metals Production
Active/Inactive Coal Mine
Coal Region
Coal Field
Oil and Gas Fields
Oil
Gas
Oil and Gas
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-10
Region II
Mining and Mineral Extraction
1:2,250,000
Western AREA POWER ADMINISTRATION
Exported On: 4/9/2013
X:\0Projects\12907_003_Transwest_Express\Figures\DocumentFigures\2013_DEIS_v3\Geology\Fig_3_02_10_SRII_MiningExtraction.mxd

Table 3.2-5 Oil and Gas Fields Crossed by Alternatives in Region II

Alternative II-A	State	Alternative II-B	State	Alternative II-C	State	Alternative II-D	State	Alternative II-E	State	Alternative II-F	State
Dinosaur	Colorado	Rangely	Colorado	Rangely	Colorado	Dinosaur	Colorado	Dinosaur	Colorado	Dinosaur	Colorado
Red Wash	Utah	Rangely Southwest	Colorado	Rangely Southwest	Colorado	Red Wash	Utah	Red Wash	Utah	Red Wash	Utah
Horseshoe Bend	Utah	Lower Horse Draw	Colorado	Lower Horse Draw	Colorado	Natural Buttes	Utah	Horse Shoe Bend	Utah	Natural Buttes	Utah
Blue Bell	Utah	Park Mountain	Colorado	Park Mountain	Colorado	Uteland Butte	Utah	Blue Bell	Utah	Uteland Butte	Utah
Altamont	Utah	Missouri Creek	Colorado	Missouri Creek	Colorado	Eight-Mile Flat	Utah	Brundage Canyon	Utah	Eight-Mile Flat	Utah
Cedar Rim	Utah	White Face Butte	Colorado	White Face Butte	Colorado	Wilkin Ridge	Utah			Wilkin Ridge	Utah
		Baxter Pass	Colorado	Baxter Pass	Colorado	Petes Wash	Utah			Petes Wash	Utah
		Bar X	Colorado	Bar X	Colorado	Castlegate	Utah				
		Harley Dome	Utah	Harley Dome	Utah	Clear Creek	Utah				
		Sieber Nose	Utah	Sieber Nose	Utah						
		Sage	Utah	Sage	Utah						
		Gravel Pile	Utah	Gravel Pile	Utah						
		Cedar Springs	Utah	Cedar Springs	Utah						
		Greater Cisco	Utah	Greater Cisco	Utah						
		Feron	Utah	Flat Canyon Creek	Utah						

Sources: Chidsey et al. 2005; UDOGM 2012a; Wray et al. 2002.

Uranium has been mined in the past in Grand County, but there are no active uranium mines at present. The Uinta Basin has a large oil shale resource and recently oil shale mining has been proposed (Enefit 2011). Other mineral resources in Region II include oil shale, gilsonite, oil sands, gypsum, salt, bentonite, geothermal, cement aggregate (sand, gravel, crushed stone) and clay (USGS 2011; UGS 1983).

3.2.5.3 Region III

Physiography and Geology

All of Region III is within the Great Basin section of the Basin and Range province (**Figure 3.2-11**) (Fenneman 1928).

In Region III, the alternative 2-mile transmission line corridors cross primarily unconsolidated deposits of alluvium, alluvial fan, pediment, and sand dune (Hintze and Davis 2002; Hintze et al. 2003; Steven et al. 1990; Rowley et al. 2006). In the northern portion of Region III, the bedrock crossed includes the Flagstaff and Little Drum Formations. South of Enterprise, Utah, there are Tertiary volcanic and sedimentary rocks and folded Mesozoic and Paleozoic rocks in the western portions of Washington County (Biek et al. 2009). Paleozoic rocks are represented by the Permian Kaibab Formation, which is largely composed of limestone. Mesozoic rocks include the Cretaceous-Tertiary Grapevine Wash Formation, Cretaceous Iron Springs Formation, and the following Jurassic-age rock units: Temple Gap Formation, the Navajo Sandstone, and Kayenta Formation. The Jurassic and Cretaceous rocks are largely composed of sandstones, siltstones, and mudstones with occasional gypsum beds. Triassic-aged rocks are the Moenave and Moenkopi Formations that largely are made up of sandstone, siltstone, mudstone, with minor limestone and gypsum. The Tertiary volcanic rocks include ash flow tuffs such as the Oligocene Leach Canyon Formation and Miocene-Pliocene Rencher Formation. Undivided lava flows also comprise the Tertiary volcanic rocks. Tertiary sedimentary deposits consist of the Paleocene-Eocene Claron Formation and Miocene and Pliocene basin fill. In the Beaver Dam Valley in the extreme southwest corner of Washington County, Utah, there are valley fill alluvial deposits (Biek et al. 2009).

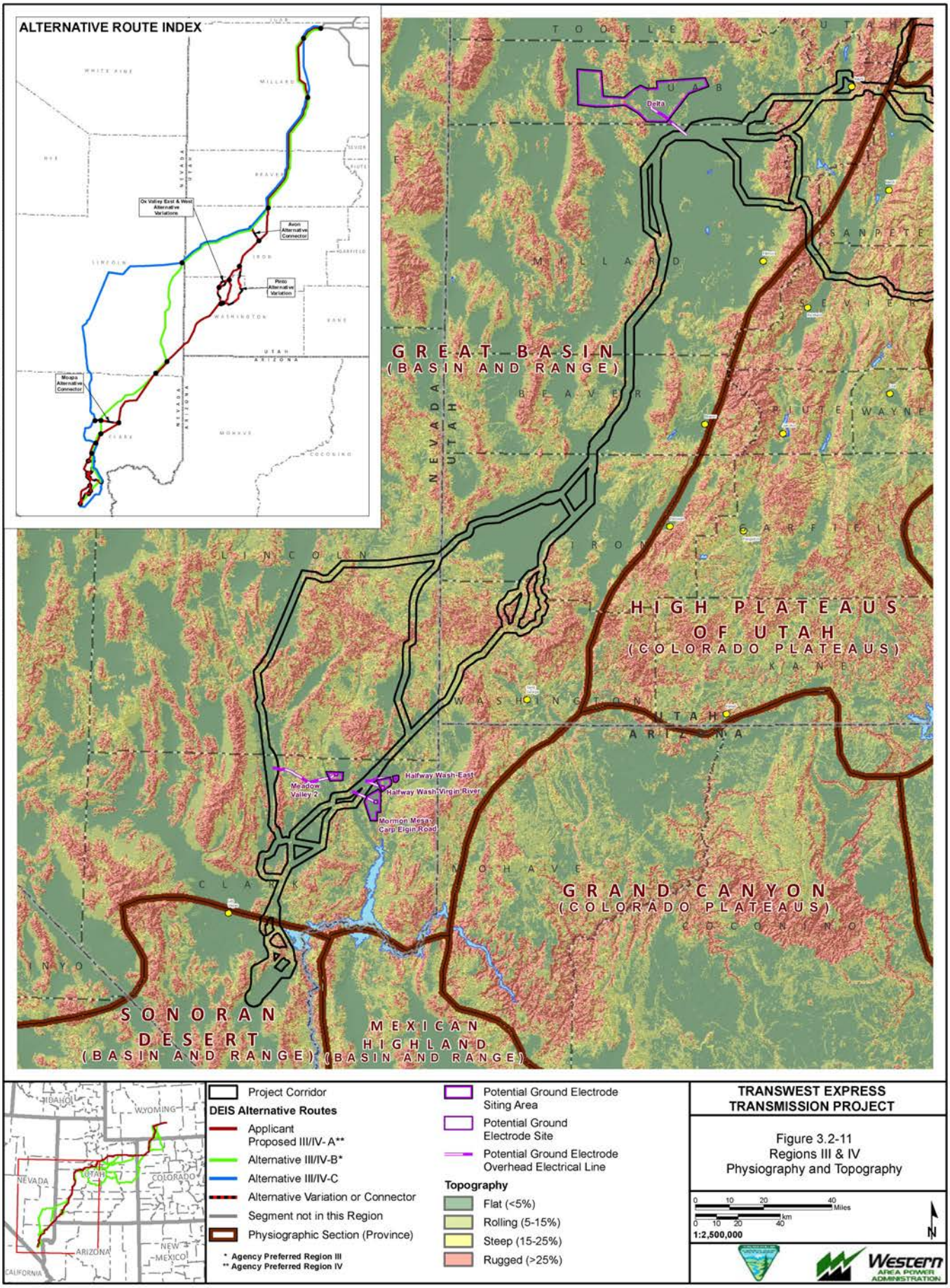
Alternative 2-mile transmission line corridors in southeastern Lincoln County, Nevada primarily cross volcanic rocks of the Clover Mountains caldera complex (Tschanz and Pampeyan 1970). After crossing mountain ranges, the 2-mile transmission line corridors drop down into valley areas covered with alluvium, alluvial fan, and playa deposits and cross occasional outcrops of Tertiary volcanic and Paleozoic rocks. In northeastern Clark County, Nevada, the 2-mile transmission line corridors cross mainly alluvial deposits, but also limited outcrops of Precambrian, Paleozoic, Triassic, and Tertiary rocks (Stewart and Carlson 1978; Tschanz and Pampeyan 1970; Longwell et al. 1965).

In Region III, Paleozoic rocks include Cambrian Prospect Mountain Quartzite, Pioche shale, and Nopa Formation, undivided Cambrian to Devonian sedimentary rocks, Pennsylvanian-Permian Bird Spring Formation, and Permian Coconino Sandstone and Kaibab Limestone. Triassic rocks include the Chinle, Moenkopi, and Thaynes Formations. The Tertiary Horse Spring Formation is found in outcrops northeast of Las Vegas, Nevada.

Geological Hazards

Seismic Hazards

Region III has less earthquake activity than Region II since the proposed alternatives are located to the west of the Utah hingeline area (USGS 2009b). In the Utah portion of Region III, there are several potentially active faults located near or on proposed routes and include the Drum Mountains fault zone west of Delta, Utah, in north central Millard County, and the Escalante Desert fault zone located at the northeast end of the Escalante Desert in northern Iron County and southern Beaver County (USGS and UGS 2006).


ALTERNATIVE ROUTE INDEX
Ox Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
GREAT BASIN
(BASIN AND RANGE)
HIGH PLATEAUS OF UTAH
(COLORADO PLATEAUS)
GRAND CANYON
(COLORADO PLATEAUS)
SONORAN DESERT
(BASIN AND RANGE)
MEXICAN HIGHLAND
(BASIN AND RANGE)
Delta
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
Project Corridor
DEIS Alternative Routes
Applicant Proposed III/IV- A**
Alternative III/IV-B*
Alternative III/IV-C
Alternative Variation or Connector
Segment not in this Region
Physiographic Section (Province)
* Agency Preferred Region III
** Agency Preferred Region IV
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Topography
Flat (<5%)
Rolling (5-15%)
Steep (15-25%)
Rugged (>25%)
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-11
Regions III & IV
Physiography and Topography
1:2,500,000
Western AREA POWER ADMINISTRATION
Exported On: 6/5/2013
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In the Nevada portion of Region III the potentially active California Wash fault is located about five miles west of Moapa in northern Clark County (Anderson 1999a). No other potentially active faults have been identified in the Region III study area; however, the south end of Delamar Valley in southern Lincoln County contains fissures of uncertain origin (Swadley 1995). These fissures, present in the Delamar and Dry Lake valleys, are not caused by groundwater withdrawal and are thought to be tectonic in origin, but are not thought to be active in the southern portions of the Delamar Valley. Active fissures may be present in the northern Dry Lake Valley, but the alternative 2-mile transmission line corridors do not cross them.

Ground motion hazard mapping indicates that there is a generally low potential for ground motion to cause serious damage from a maximum earthquake that could be predicted for the area (**Figure 3.2-1**). Alternative III-C crosses an area of slightly increased risk of ground motion, similar to the Wasatch Plateau area.

Landslides

The routes in Region III primarily cross areas of very low landslide susceptibility (Giraud et al. 2007). However, portions of the analysis area in Washington County cross areas of low to moderate landslide risk in the Bull Valley Mountains and north flank of the Beaver Dam Mountains.

Subsidence

Alternative 2-mile transmission line corridors in the Utah portion of Region III generally cross valley deposits and the potential for karst development is low. Areas within Washington County, Utah may be underlain by carbonate rocks, but no subsidence or karst has been documented (Biek et al. 2009). In the Escalante Desert in Western Iron County, there is subsidence risk associated with the withdrawal of groundwater. Investigations by the UGS (Lund et al. 2005) have shown that the ground surface in areas of the Escalante Desert has subsided as much as four feet in an area centered around Beryl Junction, Utah. In addition, ground fissures have also developed in the vicinity of Beryl Junction. Reportedly the subsidence in the Escalante Desert has not resulted in damage to surface structures or utilities (Hansen 2008).

In Nevada, Region III includes locations underlain by carbonate or evaporite rocks, but no associated subsidence or karst has been identified (National Atlas 2011). No subsidence areas due to groundwater withdrawal have been identified in the valleys in the Nevada portion of Region III.

Paleontological Resources

Three high-potential fossil-bearing formations are found within the analysis area of Region III. **Table 3.2-6** lists the formations in order of relative age and provides the PFYC ratings for the formations or geologic units. **Figure 3.2-12** shows the PFYC ratings crossed in Region III. Alternative 2-mile transmission line corridors may cross old shorelines left by fluctuations of Lake Bonneville levels during the Pleistocene (1.8 million to 10,000 years ago). Although sand and gravel deposits associated with old lake shorelines may have fossil resources, the shoreline deposits have a PFYC ranking of 2 (BLM 2008c).

Table 3.2-6 Potential Fossil-bearing Formations and PFYC Classifications in Region III

Formation/Rock Unit	Period/Epoch	PFYC Rank
Lake Bonneville Shoreline Deposits	Pleistocene	2
Muddy Creek Formation	Miocene	3a
Flagstaff Formation	Paleocene	5
Claron Formation	Paleocene	5
Cedar Mountain	Lower Cretaceous	5

Table 3.2-6 Potential Fossil-bearing Formations and PFYC Classifications in Region III

Formation/Rock Unit	Period/Epoch	PFYC Rank
Carmel Formation	Jurassic	3
Navajo Sandstone	Jurassic	3
Kayenta Formation	Jurassic	5
Moenave	Jurassic-Triassic	5
Chinle	Triassic	3
Moenkopi	Triassic	3
Kaibab	Permian	3
Toroweap	Permian	3
Big Horse Limestone Member of the Orr Formation	Cambrian	3
Pioche Shale	Cambrian	Not determined

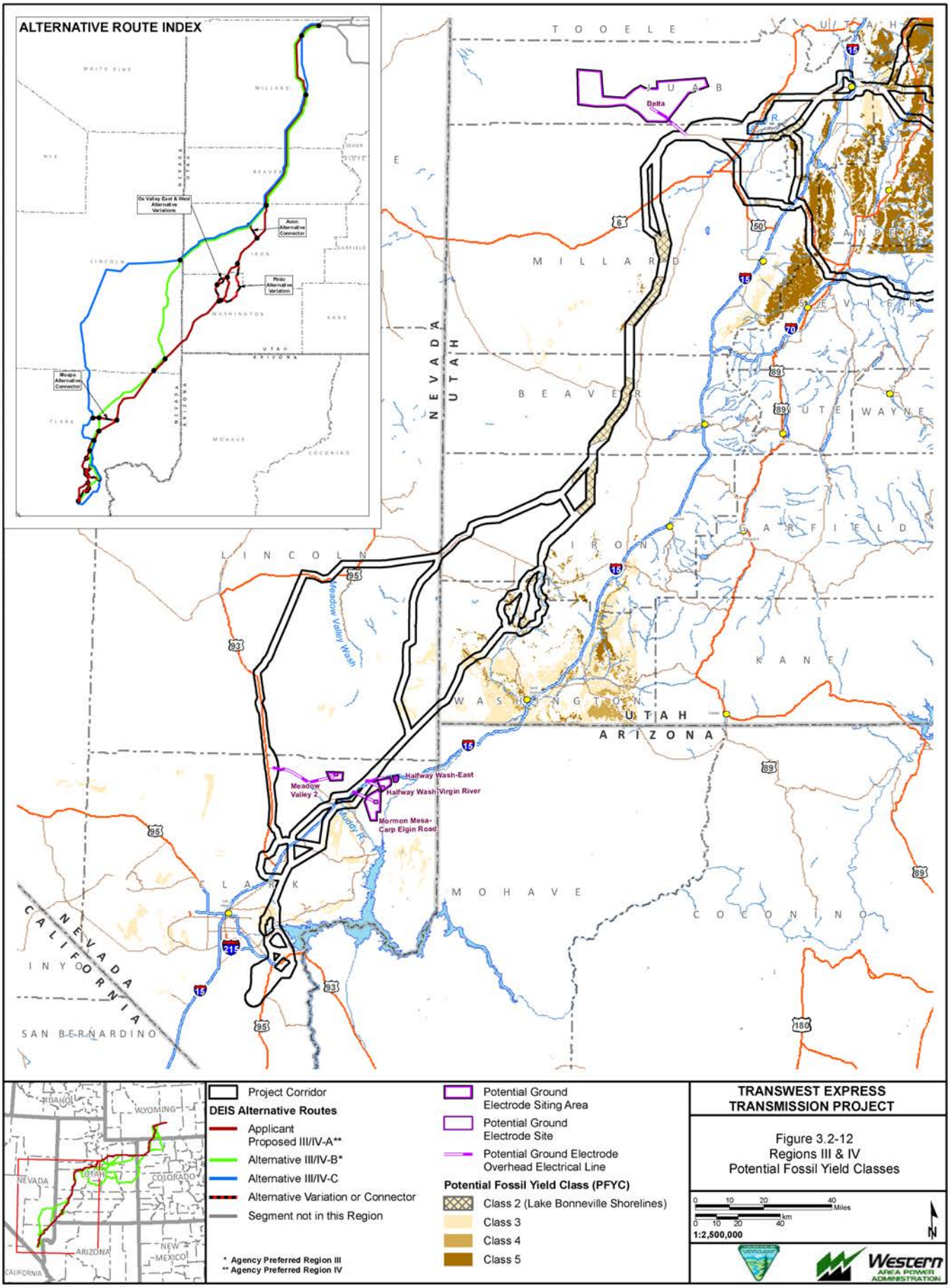
Sources: Biek et al. 2009; Hintze and Palmer 1976; USDOE and USDOI 2008.

The Cambrian-aged Pioche shale contains numerous fossil localities that have assemblages of fossil trilobites, arthropods that lived during the Paleozoic Era. The BLM has established the Oak Springs Summit Trilobite Area, located north of SH-93, about 12 miles west of Caliente, Nevada (BLM 2012c). Oak Springs Summit Trilobite Area has fossils of six types of trilobites in the Pioche Shale exposed in a gravel pit. The trilobites belong to the *Olenellidae* family and have a shell like a horseshoe crab, jointed legs, and compound eyes. These fossils are the remains of animals that lived in a shallow sea 500 to 524 million years ago. The trilobite area is within the Alternative III-C 2-mile transmission line corridor.

Mineral Resources

Important mineral resources consist of aggregate (sand, gravel, crushed stone), cement, gypsum, lime, perlite, geothermal, precious and base metals, and iron (Davis 2011; Doelling and Tooker 1983; Hess and Davis 2010; USGS 2011; UGS 1983) (**Figure 3.2-13**).The alternative 2-mile transmission line corridors cross sand and gravel mining areas along Interstate 15 in northeastern Clark County, Nevada. Although oil and gas are not yet as important as some mineral resources, there has been recent interest in oil and gas leasing. There are no coal resources in the Nevada portion of Region III (USGS and Nevada Bureau of Mines and Geology 1964). In Utah, the Applicant Proposed 2-mile transmission line corridor crosses an area underlain by coal resources of the Harmony Coal Field in northern Washington County (Tabet and Wakefield 2006). However, the coal resource potential of the Harmony Coal Field has been described as “insignificant” (Kirschbaum and Biewick 2000).

In Lincoln County, the 2-mile transmission line corridor for Alternative III-C crosses the historic mining districts of Acoma, Little Mountain, and Delamar in southeast Lincoln County, Nevada (BLM 2004). Perlite, a volcanic glass with numerous industrial applications, was mined in the Acoma District east of Caliente, Nevada (Tschanz and Pampeyan 1970). The Little Mountain District, also east of Caliente, was prospected for copper, but no commercial production was recorded. The main commodities of the Delamar District, southwest of Caliente, were gold and silver, but there were also prospects of copper and manganese. Most of the mining occurred at these districts in the first half of the 20th Century, but there is no active mining at present (Davis 2011). The only active major mine near the Alternatives III-C and III-D corridor in Lincoln County is the Tenacity perlite mine and mill, located south of SH 93 about 20 miles west of Caliente, Nevada.


ALTERNATIVE ROUTE INDEX
Oc Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
TOOELE
UTAH
MILLARD
BEAVER
SANPETE
SEVIER
UTE
WAYNE
LINCOLN
IRON
GARFIELD
KANE
WASHINGTON
UTAH
ARIZONA
CLARK
MOHAVE
COCONINO
NEVADA
CALIFORNIA
INYO
SAN BERNARDINO
Delta
Meadow Valley Wash
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
Project Corridor
DEIS Alternative Routes
Applicant Proposed III/IV-A**
Alternative III/IV-B*
Alternative III/IV-C
Alternative Variation or Connector
Segment not in this Region
* Agency Preferred Region III
** Agency Preferred Region IV
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Potential Fossil Yield Class (PFYC)
Class 2 (Lake Bonneville Shorelines)
Class 3
Class 4
Class 5
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-12
Regions III & IV
Potential Fossil Yield Classes
1:2,500,000
Western AREA POWER ADMINISTRATION
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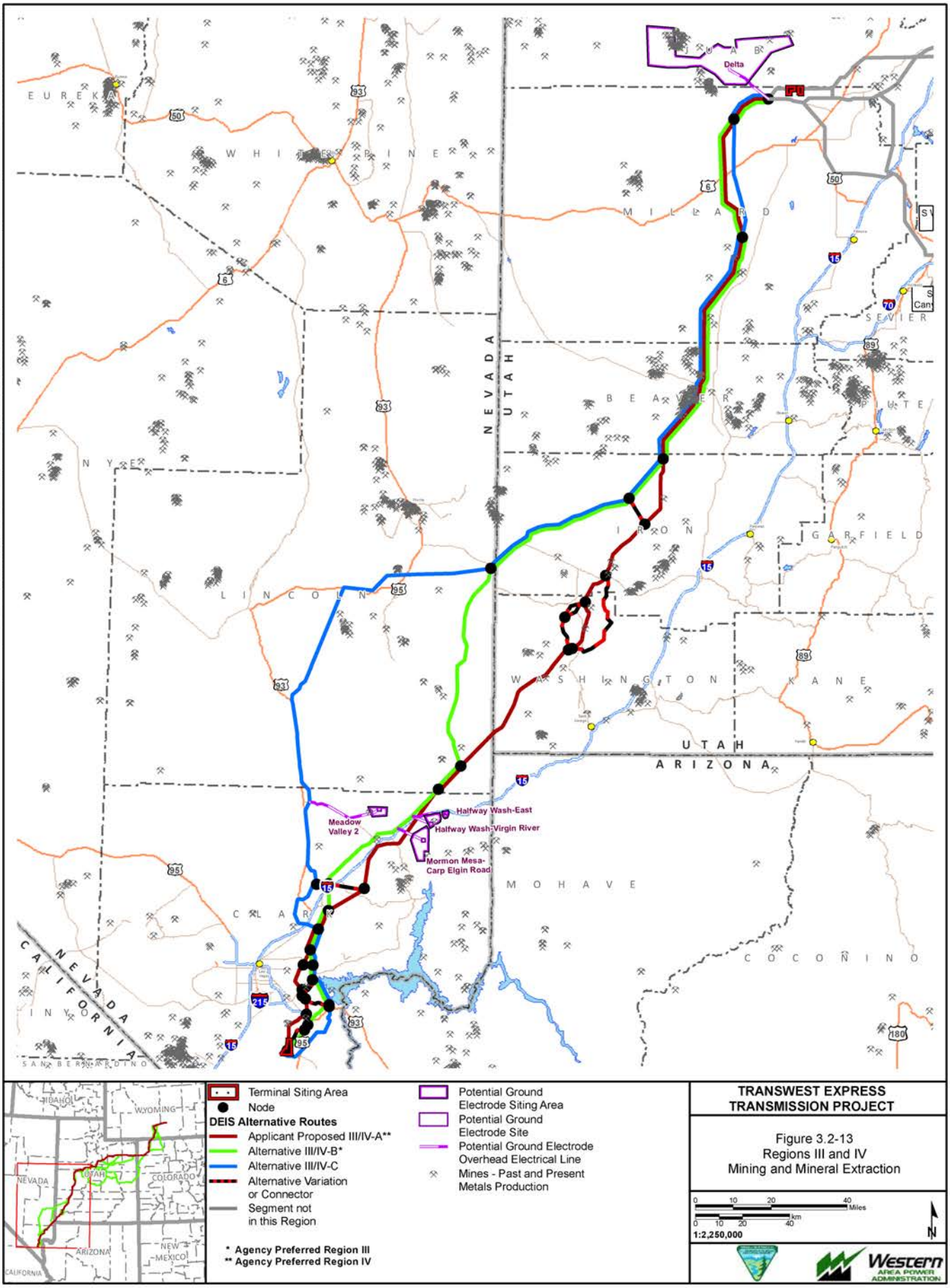
Delta
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
EUREKA
WHITE PINE
MILLARD
SEVIER
BEAVER
PIUTE
NYE
LINCOLN
IRON
GARFIELD
WASHINGTON
KANE
UTAH
ARIZONA
NEVADA
CALIFORNIA
CLARK
MOHAVE
COCONINO
INYO
SAN BERNARDINO
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed III/IV-A**
Alternative III/IV-B*
Alternative III/IV-C
Alternative Variation or Connector
Segment not in this Region
* Agency Preferred Region III
** Agency Preferred Region IV
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Mines - Past and Present Metals Production
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.2-13
Regions III and IV
Mining and Mineral Extraction
1:2,250,000
Western AREA POWER ADMINISTRATION
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The 2-mile transmission line corridor for Alternative III-B also crosses the Acoma, Vigo, and Gourd Springs mining districts in southeast Lincoln County (Tingley 1998). Very little if any mining took place in the Vigo District, which extends from the southern Clover Mountains to the south end of the Tule Springs Hills (Tingley 1984). A very small quantity of manganese was reported to have been mined in 1926, but the exact location of the prospect is not known. Other potential mineral commodities include gypsum and barium. The Gourd Springs District is located on the east side of the East Mormon Mountains. A small amount (60 tons) of manganese was reported to have been mined from a prospect in the area, but the location could not be found (Tingley 1984).

In Clark County, Nevada high quality limestone and dolomite are mined and processed in the Apex Mining District (Tingley 1998) at the Apex mine and plant operations located about 15 miles northeast of downtown Las Vegas along Interstate 15 (Township 18 South, Range 63 and 64 East). The high-purity limestone from the Crystal Pass Limestone is mined as a constituent in cement (Longwell 1965). Other designated mining districts near or crossed by Region III alternatives in Clark County include the Moapa and Muddy Mountains district. The Moapa District located south of Moapa, Nevada, contains mineral resources of gypsum, magnesite, silica, and uranium (Tingley 1998). Resources of the Muddy Mountains District located east of Interstate 15 and the Virgin River, include borates, bentonite, gypsum, magnesite, and sodium sulfate.

3.2.5.4 Region IV

Physiography and Geology

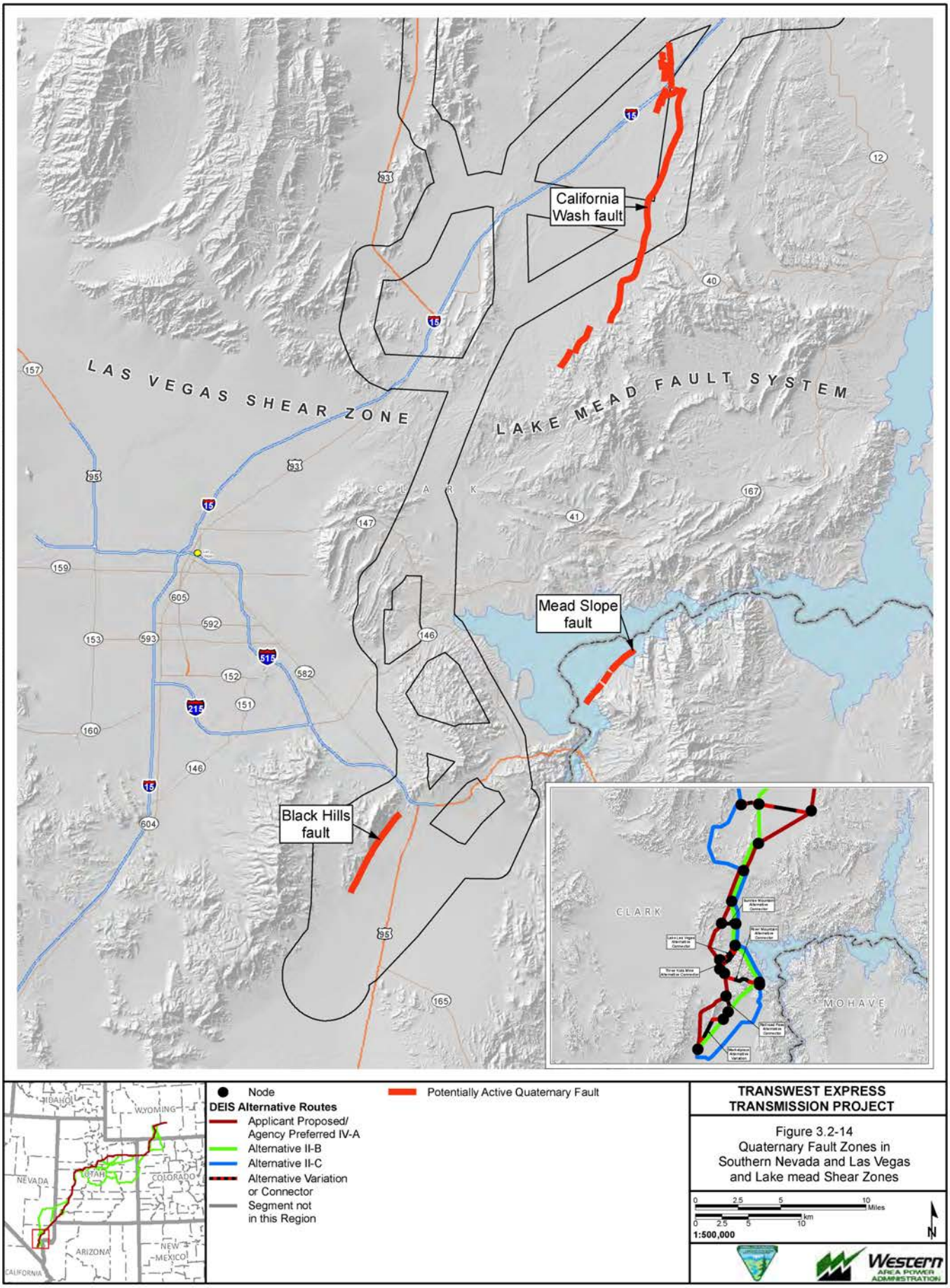
Region IV is within the Great Basin and Sonoran Desert sections of the Basin and Range province (**Figure 3.2-11**) (Fenneman 1928).

The alternative 2-mile transmission line corridors in Region IV primarily cross alluvial deposits (Stewart and Carlson 1978; Longwell et al. 1965), but also Paleozoic, Triassic and Tertiary sedimentary and volcanic rocks (tuffs and lava flows). Paleozoic rocks include the Pennsylvanian-Permian Bird Spring Formation, Permian Coconino Sandstone, and Kaibab Limestone. Triassic rocks include the Chinle, Moenkopi, and Thaynes formations. Tertiary rocks consist of the Muddy Creek and the Miocene Horse Spring formations and undivided volcanic rocks.

Geological Hazards

Seismicity

The Las Vegas Valley shear zone and the Lake Mead fault system are major east-west strike-slip structural features in Region IV that are believed to have originated as accommodations to extensional forces in the Great Basin (Page et al. 2005; Beard et al. 2010). The Las Vegas shear zone on the north side of the Las Vegas Valley is about 90 miles long and trends northwest to southeast from Mercury, Nevada to the Lake Mead region (**Figure 3.3-14**). Much of the shear zone is buried under basin fill deposits and its geometry has been determined by geophysical studies. Because the shear zone is largely buried under valley fill deposits and has not been documented to cut younger sediments, it is difficult for seismic researchers to determine late Quaternary movement with certainty. The Lake Mead fault system is a generally northeast trending complex of faults that is about 80 miles long from the Lake Mead area to the Virgin Mountains (Beard et al. 2010). Timing of activity along the Lake Mead fault system ranges in age from more than 16 million years ago (Ma) to Quaternary. The Las Vegas shear zone and Lake Mead fault system meet at the north end of the Black Mountains about 6 miles east of Frenchman Mountain, but represent two distinct directions of strike-slip movement. Both the Las Vegas shear zone and Lake Mead fault system are not shown to have potentially active faults in the USGS fold and fault database (USGS and Nevada Bureau of Mines and Geology 2006). However, the Las Vegas shear zone poses concerns as a potential source of very strong earthquakes (DePolo 2008).



TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.2-14
Quaternary Fault Zones in Southern Nevada and Las Vegas and Lake mead Shear Zones

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The Las Vegas Valley faults are generally north-south striking east dipping normal faults that are identified by prominent scarps that are present in the central part of the Las Vegas Valley (Page et al. 2005). Towards the southeast end of the valley in the Henderson area, the faults are oriented northwest-southeast, while on the northwestern part of the valley the Eglington fault strikes southwest to northeast. The Eglington fault presents a 100-foot scarp that cuts young valley deposits and is considered to be active, the most recent earthquake event has been estimated to have occurred about 2,000 years ago (dePolo 2008). The fault lengths and displacements indicate the Las Vegas Valley faults are capable of generating earthquakes of moment magnitude (M_w) of 6.3 to 6.9 (M_w is a calculation of magnitude that is a function of rock rigidity, fault area, and slip distance) (Louie 1996). It is likely that the Las Vegas fault system is cut off by the Las Vegas Valley shear zone and strong movement on the Las Vegas shear zone may activate movement on the Las Vegas Valley faults (dePolo 2008).

The Frenchman fault at the west base of Frenchman Mountain is not part of the Las Vegas Valley fault system, but is also potentially capable of posing a seismic hazard to the Las Vegas area (Castor et al. 2000). The Frenchman fault strikes to the north from around Las Vegas Wash to Nellis Air Force Base (Anderson 1999b). All of the Region IV alternative 2-mile transmission line corridors cross the Las Vegas Valley shear zone just northeast of Frenchman Mountain, but the corridors do not cross Las Vegas Valley faults. It is possible that the corridors cross the Frenchman Mountain fault as it curves around the south side of Frenchman Mountain in the vicinity of Las Vegas Wash (Bell and Smith 1980; Castor et al. 2006).

A potentially active fault of concern in Region IV is the Black Hills fault, located on the southeast flank of the Black Hills along the northeast side of the McCullough Range just southwest of Railroad Pass. The Black Hills fault is a southeast dipping normal fault that strikes northeast and forms a series of escarpments at the base of the Black Hills (Anderson 1999c). The fault is considered active because movement appears to have occurred in the last 5,000 years based on the age of the deposits offset by the fault. Recent work by Fossett (2005) indicates that the Black Hills fault may be capable of creating an earthquake of M_w 6.9. The South Terminal Siting Area, the 2-mile transmission line corridors for Alternatives IV-A, IV-B, and the Marketplace Alternative Variation may intersect or are very close to the Black Hills fault zone (a 1,000-foot wide area that extends the length of the fault zone from the base of the Black Hills to 1,000 feet into the valley) (Price and dePolo 2011).

The USGS seismic hazard mapping indicates that in areas crossed by the alternatives in Region IV, ground movement that could be triggered by a maximum credible earthquake is expected to be low; having a PGA of 10 to 15 percent of **g** with a 10 percent probability of exceeding that PGA in 50 years (Petersen et al. 2008).

Landslides

Region IV is an area of low incidence and susceptibility to landslides (Radbruch-Hall et al. 1982).

Subsidence

Subsidence due to groundwater withdrawal has long been recognized in the Las Vegas Valley (Bell et al. 2002). Since 1935, total subsidence in the valley has been approximately 5 feet. Accompanying the subsidence has been the development of ground fissures. None of the alternative 2-mile transmission line corridors cross the Las Vegas Valley or any of the subsidence areas.

Paleontological Resources

Region IV does not have formations with high fossil potential. Two medium potential formations are listed in **Table 3.2-7**. Other sedimentary rock units, mainly the Paleozoic formations listed above, may contain fossils, but also have low PFYC ratings (2 or less) (USDOE and USDOI 2008). **Figure 3.2-12** shows the PFYC ratings crossed in Region IV.

Table 3.2-7 Potential Fossil-bearing Formations and PFYC Classifications in Region IV

Formation/Rock Unit	Period Epoch	PFYC Rank
Muddy Creek Formation	Pliocene	3
Panaca Formation	Miocene-Pliocene	ND
Horse Spring Formation	Lower Miocene	3[1]
Moenkopi Formation	Triassic	3
Pakoon Limestone	Permian	ND
Tippipah Limestone	Pennsylvanian	ND
Blue Point Limestone	Mississippian	ND
Pioche Shale	Cambrian	ND

[1] PFYC based on description in BLM (2004).

Sources: BLM 2012c, 2004; Gordon 1968; Longwell 1928; McNair 1951; USDOE and USDOI 2008.

Mineral Resources

Minerals mined in the Las Vegas area (Region IV) include aggregate (sand and gravel), limestone, dimension stone, and gypsum (Davis 2011; Hess and Davis 2010; USGS 2011). The alternative 2-mile transmission line corridors cross sand and gravel and gypsum mining areas east of Las Vegas, Nevada. Coal is found in isolated localities in several counties in Nevada, but there are no commercially mineable coal seams in the state (USGS and Nevada Bureau of Mines and Geology 1964). Although a number of test wells for oil and gas have been drilled in Lincoln and Clark Counties, no commercial oil and gas production has been found (Garside and Hess 2007).

In the Muddy Mountains District, gypsum is mined at the PABCO mine in Township 20 South, Range 64 East. The gypsum has been mined at this location since 1959 (Castor et al. 2000). The gypsum is over 100-feet thick in places with nominal overburden. Production in 2010 was 682,000 tons (Driesner and Coyner 2011). The 2-mile transmission line corridor that includes the Agency Preferred Alternative and Alternatives IV-A, IV-B, and IV-C may cross or encroach upon the PABCO mine area.

In the Las Vegas Mining District, which includes Frenchman Mountain and areas northeast of Henderson, Nevada to Lake Mead (Tingley 1998), manganese was formerly mined in the region at the Three Kids Mine located on the south side of Lake Mead Drive, just northeast of Henderson, Nevada in Section 35, Township 21 South, Range 63 East (Croft 2012, Bell and Smith 1980). Mining was conducted episodically from 1917 to 1961 from manganese-rich deposits in the Muddy Creek Formation or from volcanic rocks. About 2.25 million tons of manganese ore was extracted from the mine (Longwell 1965). Since the early 1960s, the mine was idle and the mill was dismantled, but the Army Defense Logistic Agency continued to maintain stockpiles of processed material until the end of 2003. One of the former mine pits was even used as a solid waste landfill. The site is slated to become a redevelopment area after site characterization and remediation is complete (Croft 2012). The Three Kids Mine Alternative Connector crosses the Three Kids Mine site. Gypsum has also been mined in the Las Vegas district, but other potential mineral resources include limestone, sand and gravel, silica, lithium, and precious and base metals (Castor et al. 2000).

Another mining district in the Las Vegas area crossed by project alternatives is the Alunite District. The district is located southwest of Railroad Pass in the Black Hills and the commodities of interest historically included gold, tungsten, and alunite (a mineral that is mined for alum and potash) (Tingley 1998). There has been no commercial production of these commodities from the district, but sand and gravel are currently mined at pits south of Railroad Pass (Hess and Davis 2010). Portions of the Southern Terminal

Siting Area, Southern Terminal Alternative, the 2-mile transmission line corridors for Alternatives IV-A, IV-B, IV-C, the Railroad Pass Alternative Connector, and the Marketplace Alternative Variation may be within the Alunite District.

3.2.6 Impacts to Geological, Paleontological, and Mineral Resources

The impact analysis area for geologic, mineral, and paleontological resources consists of the proposed and alternative 2-mile transmission line corridors. Analysis was based on review of publicly available government documents and published literature, as well as comments from scoping.

Relevant scoping issues, management concerns, and impact concerns are listed in **Table 3.2-8**.

Table 3.2-8 Relevant Analysis Considerations for Geological, Mineral, and Paleontological Resources

Resource Topic	Analysis Considerations and Relevant Assumptions
Geologic Hazards	Evaluate risk to the proposed project of geologic hazards that include seismicity, landslides, and subsidence due to karst, groundwater withdrawal, or underground mining. Major assumptions in the analysis of the risk to the proposed project because of geological hazards include the following: • The location of active faults is based on information available from USGS (2006). Ground motion estimates are based on recent updates of the USGS seismic hazard mapping by the USGS (Petersen et al 2008). There are numerous Quaternary faults in the project area, which may rupture at any time, however, only those faults with movement in the last 15,000 years are considered to be active as determined by the USGS (2006). • Landslide risk information is based on landslide maps, landslide incident and susceptibility areas, and USGS publications. • Subsidence risk is due to groundwater withdrawal in the Escalante Desert where it has been documented (Lund et al. 2009). There is also subsidence risk over abandoned coal mines and potential karst topography in areas underlain by the North Horn Formation.
Mineral Resources	Analyze the proposed corridor and alternatives with regard to potential interference with existing mineral extraction operations, reduced access to underlying minerals, and interference with future mineral extraction operations. A major assumption used in the analysis of potential impacts to mineral resources is that mineral entry can take precedence over other land uses and that granting of a utility ROW does not overrule mineral owners' right to develop and extract minerals.
Paleontological Resources	Major issues regarding paleontological resources are loss of important fossils because of the following activities or conditions: • Ground disturbing activities such as clearing, grading, and foundation excavation. • Operational and maintenance activities that would require disturbance of previously unaffected areas within the established ROW. • Increased access resulting in vandalism or unauthorized collection. Major assumptions in the analysis of risk to paleontological resources include the following: Areas underlain by medium to high fossil potential based on the PFYC system for valuable fossil resources were defined on the basis of literature review with heavy reliance on USDOE and USDOI (2008, Appendix N). No field surveys were conducted.

Impacts would occur if the following conditions were to result from the construction, operation, and decommissioning of the proposed facilities:

- An impact from geologic hazards would occur if seismicity, landslides, or subsidence were to result in damage to facilities or interruption of service.
- Landslides could also occur as a result of instability from ground disturbance during construction.
- Impacts to mineral resources would occur if mineral resources of economic value are lost or made inaccessible for future use.
- An impact to fossil resources would result if project activities cause the loss or damage to scientifically important paleontological resources.

3.2.6.1 Impacts from Terminal Construction and Operation

Northern Terminal

There are no identified geologic hazards of concern at the Northern Terminal Siting Area.

The Northern Terminal Siting Area encompasses a geologic structure called the Grenville Dome, an elongate east-west anticline about 5 miles long and 2-3 miles wide. Although several oil and gas tests have been drilled on the structure, no commercial production has been established (Wyoming Oil and Gas Conservation Commission [WOGCC] 2011). Coal may be present in the underlying bedrock, but the potential for mineable resources is low (BLM 2008b). There are no gravel pits within the siting area (WDEQ 2011).

The Northern Terminal Siting Area is underlain by bedrock that has the potential to contain fossils and include the Steele Shale, Niobrara Formation, Frontier Formation, Mowry Shale. These units have PFYC ratings ranging from 3 to 5 (**Table 3.2-2**), indicating the potential for direct and indirect impacts to fossil resources. BMPs PAL-1 through PAL-5 and design options TWE-4,TWE-38, and TWE-39 provide for protection of paleontological resources ranging from pre-construction surveys and documentation of resources, re-routing or avoidance, recovery if avoidance is not possible, and proper documentation and curation of recovered fossils, all of which would be detailed in a Paleontological Resources Management and Mitigation Plan.

Terminal decommissioning activities likely would occur in previously disturbed areas; therefore, no impacts to paleontological resources would be anticipated. If new disturbance is expected, then the application of appropriate BMPs would be required for protect potential fossil resources. No impacts to project facilities from geological hazards or mineral resources would be expected.

Southern Terminal

The Southern Terminal Siting Area is located near the Black Hills fault zone, which may be active. As discussed in Section 3.2.5.4, the Black Hills fault may be capable of generating earthquakes of up to M_w 6.9. Earthquakes of this magnitude have the potential to generate strong ground motion that could damage surface structures. Expected ground motions in any given area are dependent on several factors including distance from the source, local geology, and depth to shallow water. As presented in Section 3.2.5.4, ground motions that might be experienced in southern Nevada could range from 10 to 15 percent of **g** (Petersen et al. 2008). Magnitude is a measure of the energy released from the source earthquake, but intensity is a measure of shaking and associated effects on people and structures (USGS 2010). **Table 3.2-9** compares peak ground acceleration as a percent of **g** to intensity as defined on the Modified Mercalli Intensity Scale. From the table it can be seen that ground motions of 10 to 20 percent of **g** would damage poorly built and non-resistant structures, but well designed structures would sustain slight to no damage.

Table 3.2-9 Abridged Modified Mercalli Intensity Scale Compared to Peak Ground Acceleration

Intensity	Definition	PGA – Percent Acceleration Gravity (g)
I	Not felt except by a very few under especially favorable conditions	
II	Felt only by a few persons at rest, especially on upper floors of buildings.	
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.	
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	1.5 to 2.0
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.	3.0 to 4.0
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.	6.0 to 7.0
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.	10.0 to 15.0
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.	25.0 to 30.0
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.	50 to 55
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.	More than 60
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.	As above
XII	Total damage. Objects thrown into the air.	As above

Source: Modified from Bolt (1993) and USGS (2010).

It should be noted that electrical transmission system vulnerability to seismic effects depends on which system components are involved. Transmission structures generally survive well in earthquake events since they are composed of lightweight structures at individual locations connected by conductors that have the ability to adjust to the vibrations of ground motion (Rocky Mountain Power 2010). In addition, structures are built to a standard for wind and ice structural loadings and as such exceed earthquake design loads (American Society of Civil Engineers 1991). A ground electrode bed would not be expected to be adversely affected by the expected ground motions. However, transmission structures are at a somewhat greater risk when built on soils prone to liquefaction. Other facilities such as substations and associated equipment such as ceramic insulators do not fare as well unless specific design considerations are built in or are retrofitted to existing facilities (Yokel 1990).

Because the Southern Terminal Siting area is in an area that could be affected by movement on the Black Hills fault, the following mitigation measure is (**GE-1**) is recommended:

***GE-1**: In areas with geologic hazards (e.g., ground shaking, liquefaction, landslides, subsidence from karst, groundwater withdrawal, underground mining, historic mining) and active mining; placement of project structures and other project related disturbance would be avoided to the extent practical. Where avoidance is not possible a site specific geotechnical investigation and engineering design would be implemented during construction and operation of the Project. Depending on the type of potential geologic hazards, the designs may vary and should address specific needs for enhanced structural supports. Site-specific assessment of geologic hazards shall include review of available information concerning areas of mapped hazards and consultation with appropriate governmental agency (USFS, BLM, UGS, USGS) personnel who are knowledgeable about the hazards. Assessment also shall include, if necessary, field surveys and gathering of geotechnical information to determine what engineering design methods would mitigate or lessen potential risks. If active mines cannot be avoided, applicant will conduct similar due diligence in regard to hazards from underground and historic mining to ensure that project facilities will not hinder access to mineral resources or create dangers to mining activities.*

Effectiveness: The mitigation measure would reduce impacts from geologic hazards by incorporating design standards to provide damage protection or by avoidance to lessen risk. The mitigation would also reduce impacts to reduced access to mineral resources.

In addition to the protection measures identified above, some BLM field offices may have stipulations concerning land use restrictions in high landslide incidence areas (**Appendix C**).

As discussed in Section 3.2.5.4, although there is potential for gold, tungsten, and alunite in the Alunite District, those commodities were never commercially mined. The Southern Terminal Siting Area would not interfere with the sand and gravel pits just south of Railroad Pass.

Southern Terminal Alternate

Potential impacts with regard to geologic hazards, paleontological resources, and mineral resources for the Southern Terminal Alternate would be the same as the Southern Terminal.

Southern Terminal near IPP (Design Option 2)

Two fault zones cross the Design Option 2 Delta Ground Electrode Bed Area: the Drum Mountains fault zone and Crater Bench faults (Black et al. 1999a; Black et al. 1999b). The Drum Mountains fault zone is a complex of east- and west-dipping normal faults east of the Drum Mountains. Paleoseismic studies indicate that movement has cut young deposits so that movement may have occurred less than 15,000 years ago, making these faults potentially active. The Crater Bench faults are northeast striking faults east of the Drum Mountains fault zone. The faults also cut deposits younger than Lake Bonneville deposits and therefore may be potentially active. The fault zones described can be easily avoided and the ground bed electrode site can be located away from the fault zones and stay within the boundary of the Delta Ground Electrode Area. Implementation of measure **GE-1** would reduce or eliminate potential impacts with regard to active faults.

The Southern Terminal for Design Option 2 is located on federal minerals that are leased for geothermal exploration (see Section 3.14, Land Use, and **Figure 3.14-18**). The Delta Ground Electrode Bed Area also contains leased geothermal areas and a Known Geothermal Resource Area (KGRA). This situation may lead to potential conflicts with geothermal exploration and development. The substation at the terminal site would have to be located in such a manner to not interfere with geothermal exploration or development. The associated ground electrode bed for Design Option 2 can be located according to siting criteria for ground electrode beds as described in Section 4.2.3 of the PDTR (**Appendix D**) such that the electrode

bed would not interfere with geothermal exploration or future geothermal facilities on nearby leased and lands designated as a KGRA.

Design Option 3 – Phased Build Out

Impacts from development of this design option would be the same as those discussed throughout Section 3.2.6.1, Impacts from Terminal Construction and Operation and Section 3.2.6.2, Impacts Common to All Alternative Routes.

The Southern Terminal Siting Area is not underlain by bedrock that has the potential to contain important fossils. The area is underlain by Tertiary volcanic rock and valley fill alluvium (Longwell et al. 1965), both of which have a low potential to contain fossils.

Terminal decommissioning activities likely would occur in previously disturbed areas; therefore, no impacts to paleontological resources would be anticipated. If new disturbance is expected, then the application of appropriate BMPs would be required to protect potential fossil resources. No impacts to project facilities from geological hazards or mineral resources would be expected.

3.2.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

Direct impacts of geological hazards during construction would be the potential for grading and excavation to undercut slopes causing instability of slopes and endangering construction crews. BMP **SOIL-2** limits the creation of excessive slopes during excavation and requires site-specific, specialized construction techniques in areas of steep slopes.

Indirect impacts may result from changes in slope and grade that may increase runoff and erosion. There is a potential for seismically induced ground instability that may be further enhanced by undercutting of slopes. Ground motion from a strong earthquake has the potential to initiate movement of unstable earth, although the actual frequency of earthquake-induced landslide occurrence in Utah is not certain (Christenson 2004). Lessening the potential impact of seismically induced landslides would involve implementation of mitigation measure **GE-1**.

A direct impact to mineral resources would occur if construction activities were to prevent access to mineral resources. Any mineral access issues would occur during active construction and amount to road closures or other access restrictions while construction is conducted in a given area. However, other impacts could occur such as land use conflicts and set back limitations that might occur in densely spaced oil and gas field developments. TWE has committed to site the ROW to avoid wellheads and associated facilities at wellheads, and would implement an additional 250-foot avoidance buffer during final centerline siting (TWE 2012). There are additional restrictions described in Appendix C regarding transmission line location and mineral operations.

Conclusion: The proposed project is not expected to preclude or restrict access to minerals resources.

Direct impacts to or destruction of fossils may occur from facility construction activities conducted through medium to high potential fossil beds. Indirect impacts during construction would include erosion of fossil beds due to slope re-grading and vegetation clearing or the unauthorized collection of scientifically important fossils by construction workers or the public due to increased access to fossil localities along the ROW.

BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 provide for protection of paleontological resources ranging from pre-construction surveys and documentation of resources, re-routing or avoidance, recovery if avoidance is not possible, and proper documentation and curation of

recovered fossils. These measures would provide a process to protect the resources and potentially add to scientific knowledge. Such measures are highly effective in reducing loss or destruction of the resource. In addition to the protection measures cited above, some BLM field offices have specific protection measures or stipulations for the protection of specific formations or PFYC classes (**Appendix C**).

Conclusion: Project construction would not be expected to result in the loss or damage of scientifically important paleontological resources.

Operation Impacts

During operation and maintenance of the proposed facilities, direct impacts due to seismicity would include permanent ground deformation at faults or ground movement that would cause damage to facilities.

Direct impacts from landslides or unstable ground would result in loss of ground support to structures. Electrical transmission lines have reportedly been impacted by ground stability hazards on the Wasatch Plateau in areas associated with the North Horn Formation. Structural failure and relocation of transmission line routes have resulted because of landslides (debris flows) due to anomalous precipitation events (Smith 2011). Also, large debris flows have occurred in the Wasatch Plateau and well documented examples are the Thistle and Manti Landslides (Fleming 1988; Witkind 1986). Both landslides involved millions of cubic feet of earth material and were older slides reactivated by anomalous precipitation and runoff. The Thistle Landslide, which occurred in April 1983 about 8 miles east of Spanish Fork, Utah, was large enough to block Spanish Fork Canyon and dam water upstream of the slide. The Thistle Landslide also took out the Denver Rio Grande railroad and US Highways 6/89, and the town of Thistle was flooded and destroyed by the impoundment of water behind the slide. The Manti Landslide developed on the south rim of Manti Canyon about 6 miles east of Manti, Utah. The landslide was activated in June 1974 during a period of runoff of heavy snowmelt runoff and eventually grew to dimensions of about 2.2 miles long and 0.5 mile wide. In spite of its size, no structures were threatened or damaged.

Any landslide deposits could be rendered unstable with increased precipitation or high levels of moisture, especially during periods of high runoff of periodic heavy snow cover. Impacts from landslides or unstable ground would result in damage to structures and ultimately disruption in service. Implementation of mitigation measure **GE-1** would lower the risk of locating facilities on unstable areas by the use engineering design and appropriate construction practices to lessen potential impacts due to landslides.

Direct impacts due to ground subsidence also would result in the loss of ground support to structures with the potential to damage and disrupt operations. Implementation of mitigation measures **GE-1** would lower the risk of subsidence.

Conclusion: Through implementation of BMPs, design features, and mitigation measures, the risk of damage from seismicity, landslides or subsidence would be substantially reduced.

A potential direct impact during operation would be loss of access to mineral resources and prevention of the mineral owner (including governmental entities) to develop minerals. However, the linear nature of the project would minimize any potential restriction of access to mineral resources.

Indirect effects could occur to mineral industry facilities (such as pipelines and wells) located adjacent to or within the operational ROW due to EMF. Effects from EMF would be dealt with by implementation of BMP **PD-2**, which calls for identification and delineation of existing underground metallic pipelines or well casings in the vicinity of a proposed electricity transmission line project and to design the project to avoid accelerating the corrosion of the pipelines and pumping wells. See Section 3.18, Public Health and Safety for additional information on the effects of EMF.

Conclusion: Project operation would not preclude access or prevent the development of mineral resources.

Indirect impacts may occur to paleontological resources over an extended period of time, because of increased access to medium to high fossil potential formations. The BMPs and design features that protect paleontological resources discussed in construction impacts would lessen the risk of impacts if maintenance activities occur outside of previously disturbed areas. However, the resource would still be at risk through the continuation of natural processes (e.g. erosion) and unauthorized collection.

Conclusion: Project operation would not be expected to result in the loss or damage of scientifically important paleontological resources.

Decommission Impacts

Potential impacts from Project decommissioning to geological hazards and mineral resources are similar to construction impacts, but to a lesser degree. Decommissioning activities would likely occur in previously disturbed areas; therefore no impacts to paleontological resources would be anticipated. If new disturbance is expected, then the application of appropriate BMPs and mitigation measures would be required to protect potential fossil resources similar to construction. Decommissioning may have a positive impact in that the removal of facilities would allow access to mineral resources.

Conclusion: Project decommissioning would not be expected to result in mineral resources of economic value being lost or made inaccessible for future use, or result in the loss or damage to scientifically important paleontological resources.

3.2.6.3 Region I

Project construction, operation, and decommissioning impacts in Region I would be the same as those discussed in Section 3.2.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.2-10** provides a comparison of impacts associated with the alternative routes in Region I after consideration of BMPs, design features, and mitigation measures.

Table 3.2-10 Summary of Region I Alternative Route Impacts

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Seismicity	No active faults; low ground motion potential.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A
Landslides	Generally low incidence and moderate susceptibility.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A
Subsidence	Low potential for karst areas.	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A
Mineral Resources	Route crosses 7 oil and gas fields. No active coal mine permit areas are crossed.	Route crosses 12 oil and gas fields. No active coal mine permit areas are crossed.	Route crosses 8 oil and gas fields. No active coal mine permit areas are crossed. Crosses area of abandoned coal mines south of Craig, Colorado.	Route crosses 7 oil and gas fields. No active coal mine permit areas are crossed.
Paleontological Resources	PFYC Class 3: 29 miles Class 4: 2 miles Class 5: 92 miles	PFYC Class 3: 29 miles Class 4:2 miles Class 5: 111 miles	PFYC Class 3: 76 miles Class 4: 2 miles Class 5: 74 miles	PFYC Class 3: 29 miles Class 4: 2 miles Class 5: 123 miles

There are no active faults in Region I and expected ground motions from an earthquake would be low. Seismicity impacts are expected to be minimal for all four alternative routes. Region I has a generally low incidence and moderate susceptibility to landslides. Although many oil and gas fields are crossed, mineral resource access issues would only occur during active construction and consist of road closures or other access problems while construction is conducted in a given area. No alternatives cross proposed coal lease tracts (BLM 1980). The proposed route and alternatives cross medium to high fossil potential formations as listed on **Table 3.2-2**.

Alternative I-A (Applicant Proposed)

Key Parameters Summary

Alternative I-A would not be expected to be impacted by seismicity, landslides, or subsidence that results in damage to facilities or interruption of service. Seven oil and gas fields would be crossed. Approximately 92 miles of PFYC Class 5 formations would be crossed.

Alternative I-B

Key Parameters Summary

Alternative I-B would not be expected to be impacted by seismicity, landslides, or subsidence that result in damage to facilities or interruption of service or result in mineral resources of economic value being lost or made inaccessible for future use. Twelve oil and gas fields would be crossed. Approximately 111 miles of PFYC Class 5 formations would be crossed.

Alternative I-C

Key Parameters Summary

Alternative I-C would not be expected to be impacted by seismicity, landslides, or subsidence that would result in damage to facilities or interruption of service or result in mineral resources of economic value being lost or made inaccessible for future use. Eight oil and gas fields would be crossed. Approximately 74 miles of PFYC Class 5 formations would be crossed. Alternative I-C does not cross the proposed coal lease tracts in the Green River Coal Field as defined by BLM (1980). Corridor segment 190.00 contains historic coal mining areas near Craig, Colorado where subsidence has been documented (Colorado Geological Survey 2011). Implementation of mitigation measure **GE-1** would reduce the risk of impacts of mine subsidence.

Alternative I-D (Agency Preferred)

Key Parameters Summary

Alternative I-D would not be expected to be impacted by seismicity, landslides, or subsidence that result in damage to facilities or interruption of service or result in mineral resources of economic value being lost or made inaccessible for future use. Seven oil and gas fields would be crossed. Approximately 123 miles of PFYC Class 5 formations would be crossed.

Tuttle Easement Micro-siting Options 1, 2, and 3

The geologic formations crossed by the Tuttle Easement micro-siting options 1, 2, and 3 would not differ substantially from Alternative I-D. The micro-siting options would not pose a greater risk to paleontological or mineral resources or increased risk from geologic hazards.

Alternative Connectors in Region I

Table 3.2-11 summarizes impacts and advantages associated with the alternative connectors in Region I.

Table 3.2-11 Summary of Region I Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Mexican Flats Alternative Connector	Low geologic hazard risk; one oil and gas field crossed; 5 miles of Class 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Baggs Alternative Connector	Low geologic hazard risk; three oil and gas fields crossed; 16 miles of Class 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Fivemile Point North Alternative Connector	Low geologic hazard risk; one oil and gas field crossed; 3 miles of Class 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector
Fivemile Point South Alternative Connector	Low geologic hazard risk; one oil and gas field crossed; 3 miles of Class 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the northern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided in the project POD. The impacts associated with constructing and operating this system are the same as discussed for Alternative I-A. **Table 3.2-12** summarizes impacts associated with the eight combinations of alternative route and location possibilities for the northern ground electrode system.

Table 3.2-12 Summary of Region I Alternative Ground Electrode System Impacts

Ground Electrode System Name	Analysis
Separation Flat – All Alternative Routes	Potential impacts to paleontological resources; bedrock consists of the Battlespring Formation (PFYC 3). No impacts regarding geological hazards or mineral resources.
Separation Creek – All Routes	Potential impacts to paleontological resources; bedrock consists of Fort Union Formation (PFYC 3), Lance Formation (PFYC 5), and Lewis Shale (PFYC 3). No impacts regarding geological hazards or mineral resources.
Eight-Mile Basin – All Routes	Potential impacts to paleontological resources; bedrock consists of Steele Shale (PFYC 3); Niobrara Formation (PFYC 5); and Mesaverde Formation (PFYC 3-5). No impacts regarding geological hazards or mineral resources.
Shell Creek (Alternative I-A)	Potential impacts to paleontological resources; bedrock consists of Green River Formation (PFYC 4-5); Wasatch Formation (PFYC 5), and Washakie Formation (PFYC 5). No impacts regarding geological hazards or mineral resources.
Shell Creek (Alternative I-B)	Impacts would be the same as Shell Creek (Alternative I-A).
Little Snake East (Alternative I-A)	Potential impacts to paleontological resources; bedrock consists of the Wasatch Formation (PFYC 5). No impacts regarding geological hazards or mineral resources.
Little Snake West (Alternative I-A)	Impacts would be same as Little Snake East (Alternative I-A).
Little Snake East (Alternative I-B)	Impacts would be same as Little Snake East (Alternative I-A).

Region I Conclusion

There are no appreciable differences (**Table 3.2-10**) between the Region I alternative corridors in terms of geologic hazards since no active faults are crossed by any of the routes, potential seismic ground motion is low, landslide incidence is low, and there are no ground subsidence hazards. Potential impacts to

minerals are similar except that Alternate I-B crosses more oil and gas fields than the other alternatives. Although coal resource areas are crossed, none of the alternatives cross active mining areas. The alternatives are similar regarding potential impacts to paleontological resources in Class 3 and Class 4 formations. Alternative I-D crosses more miles of Class 5 formations than the other alternatives. The alternative connectors are essentially the same except that the Baggs Alternative Connector may pose more impact to paleontological resources since it crosses 16 miles of PFYC rank 5 formations, as compared to 5 miles or less for the others (**Table 3.2-11**). Paleontological resources are the most potentially impacted by the ground electrode systems (**Table 3.2-12**). Except for Separation Flat, the ground electrode systems are essentially the same in that they have the potential to impact PFYC 4 or 5 formations. No impacts due to geological hazards or mineral resources are anticipated for any of the ground electrode systems. None of the areas appear to have oil and gas well densities that would preclude the siting of a ground electrode system.

3.2.6.4 Region II

Project construction, operation, and decommission impacts in Region II would be the same as those discussed in Section 3.2.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.2-13** provides a comparison of impacts associated with the alternative routes in Region II.

Alternative II-A (Applicant Proposed)

The Alternative II-A corridor has potential for impacts from seismically induced ground instability, which would be decreased through implementation of mitigation measure **GE-1**. It also would be subject to increased slope instability where the route crosses the High Plateaus of Utah (**Figure 3.2-8**). The route crosses not only the North Horn Formation with its high degree of susceptibility to landslides, but also other areas of unstable bedrock and surficial materials. Although the presence of North Horn Formation bedrock has been implicated in many slides and incidents of instability, the landslide mapping by the UGS (Elliott and Harty 2010) clearly shows extensive landslide deposits beyond the areas underlain by the North Horn formation. Construction on unstable materials or on dormant landslide deposits could result in instability and present safety hazards and construction delays.

The Alternative II-A corridor would cross the Thistle Landslide area. From where it enters Wasatch County to about 10 miles east of Nephi, Utah the Proposed Route II-A covers large areas of mapped landslides (Elliott and Harty 2010). The landslide material is characterized as up to 10 feet deep and ranges from easily identified discrete landslide deposits to material coalesced from several landslides. This is an extensive area (8 miles of the 2-mile transmission line corridor) of landslide deposits about 7 miles north of Fountain Green, Utah. The implementation of mitigation measure **GE-1** would reduce the impacts of landslides in the Wasatch Plateau. This mitigation measure would be applied in identified landslide and landslide-prone areas associated with the North Horn, Green River, and Duchesne River formations.

The Alternative II-A corridor crosses the south end of the Strawberry fault zone in Wasatch County just east of the Utah-Wasatch county line. The Strawberry fault zone is generally a north-trending 20 mile-long fault zone that bounds the east side of the Strawberry Valley (Black et al. 1999c). The fault is recognized on well developed scarps and evidence indicates that movement has taken place on the fault 3 times in the last 15,000 to 30,000 years. This alternative also crosses the south end of the Nephi Segment of the Wasatch fault zone just north of Nephi, Utah (Black et al. 2004a). Evidence from faulted surficial deposits indicates that movement on the Nephi segment may have occurred as recently as 300 to 1200 years ago. North of Delta, the Proposed Route II-A crosses the Sugarville Area Faults. The short northeast trending faults are about 4 miles north of Sugarville, Utah and cut Pliocene and Holocene sediments with evidence indicating at least two seismic events (Black et al 1999d). The Nephi Fault has been assigned a potential maximum magnitude that ranges from 6.8 to 7.2 (Petersen et al. 2008). The Strawberry Fault has a potential magnitude of 6.92. The Sugarville Faults have not been assigned an expected earthquake magnitude. Implementation and mitigation measure **GE-1** would reduce potential impacts due to potentially active faults.

Table 3.2-13 Summary of Region II Alternative Route Impacts

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Seismicity	Moderate to high risk for ground deformation and strong ground motion. Crosses 3 active fault zones.	Same as Alternative II-A. Crosses 4 active fault zones.	Same as Alternative II-A. Crosses 5 active fault zones.	Low to moderate risk. Crosses 2 active fault zones.	Same as Alternative II-D.	Same as Alternative II-D.
Landslides	Moderate to high risk for landslide impacts.	Same as Alternative II-A.	Same as Alternative II-A.	Same as Alternative II-A.	Same as Alternative II-A.	Same as Alternative II-A.
Subsidence	Low to moderate risk for ground subsidence. Crosses historic coal mining areas.	Same as Alternative II-A.	Slightly higher risk than Alternatives II-A and II-B since evidence of sinkholes found near the route.	Same as Alternative II-A.	Same as Alternative II-A.	Same as Alternative II-A.
Mineral Resources	6 oil and gas fields crossed. Encroaches on lease by application and proposed coal mining areas at the Deserado Mine. Crosses historic coal mine areas northwest of Deserado Mine.	15 oil and gas fields crossed. In Colorado, Deserado mine permit area crossed. In Utah, Deer Creek Coal Mine permit area crossed. Approximately 15 miles of active mine permit areas crossed.	15 oil and gas fields crossed. In Colorado, Deserado mine permit area crossed. In Utah, the II-C corridor encroaches on the eastern side of the active Emery coal mine.	9 oil and gas fields crossed. In Utah, crosses active and inactive coal mining areas as well as potential coal development areas in the Book Cliffs and Wasatch coal fields. Approximately 5 miles of active mine permit areas crossed. Encroaches on lease by application and proposed coal mining areas at the Deserado Mine. Crosses historic coal mine areas northwest of Deserado Mine.	5 oil and gas fields crossed. Encroaches on lease by application and proposed coal mining areas at the Deserado Mine. Crosses historic coal mine areas northwest of Deserado Mine.	7 oil and gas fields crossed. Encroaches on lease by application and proposed coal mining areas at the Deserado Mine. Crosses historic coal mine areas northwest of Deserado Mine.
Paleontological Resources	PFYC Class 3: 8 miles Class 4: 0 miles Class 5: 120 miles	PFYC Class 3: 116 miles Class 4: 6 miles Class 5: 74 miles	PFYC Class 3: 127 miles Class 4: 6 miles Class 5: 77 miles	PFYC Class 3: 20 miles Class 4; 0 miles Class 5: 129 miles	PFYC Class 3: 9 miles Class 4: 0 miles Class 5: 113 miles	PFYC: Class 3: 8 miles Class 4: 0 miles Class 5: 156 miles

There is not a comprehensive database concerning subsidence and karst hazards regarding the North Horn Formation and Flagstaff Limestone in the Wasatch Plateau or valleys in adjacent areas to the west of the plateau. It is not certain how widespread the phenomenon is because in the reports cited above, the descriptions of sinkholes were incidental to the main subject of the respective reports. Because of this it is not possible to assign a risk to the alternatives; however, since all the routes cross the North Horn formation and Flagstaff Limestone, they are potentially subject to ground subsidence hazard risks, which can include loss of support and subsequent damage to structures and possibly loss of service. The risk of subsidence hazards would be substantially reduced by implementation of mitigation measure **GE-1**.

The Alternative II-A 2-mile transmission line corridor lies just north of the Deserado Mine permit area and may encroach upon lease by application and proposed mining areas (BLM 2011). Also, there are historic coal mines within or adjacent to the corridor northwest of the Deserado Mine in Township 3 North, Range 102 West (Carroll 2006). Implementation of mitigation measure **GE-1** would lower the risk of encountering subsidence from active or historic mining.

Alternative II-A may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. It is recommended BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines to protect potential fossil resources.

Key Parameters Summary

There is an elevated risk that landslide areas crossed by Alternative II-A might result in damage to facilities or interruption of service during the operation of the Project, which would be a significant impact. Seismicity and subsidence risks would not be expected to result in damage to facilities or interruption of service during the operation of the Project. Six oil and gas fields would be crossed. Approximately 120 miles of PFYC Class 5 formations would be crossed.

<u>Strawberry IRA Micro-siting Options 1, 2, and 3</u>

The geologic formations crossed by the Strawberry IRA micro-siting options 1, 2, and 3 would not differ substantially from Alternative II-A. The micro-siting options would not pose a greater risk to paleontological or mineral resources or increased risk from geologic hazards.

<u>Alternative II-B</u>

Alternative II-B also crosses isolated landslide deposits between Huntington and Mount Pleasant, Utah and landslide deposits north and east of Fountain Green, but the deposits are not quite as extensive as the ones further north crossed by Alternative II-A. The Manti Landslide is less than 30 miles south of Alternative II-B where the alternative crosses the high terrain between Huntington and Mount Pleasant. The alternative also crosses areas of high landslide risk in the Baxter Pass area in western Garfield County, Colorado where the route follows the Baxter Pass Road. Landslides have occurred on steep slopes underlain by sandstones, siltstones, and shales of the Green River and Mesaverde formations (Stover 1985). As discussed in Alternative II-A above, implementation of mitigation measure **GE-1** would lessen potential landslide impacts; however there would remain an elevated risk that a landslide in this area might result in damage to facilities or interruption of service during the operation of the Project.

Alternative II-B crosses the Joes Valley faults about 20 miles northwest of Huntington, Utah. The faults consist of 2 parallel north-south trending fault zones (Black et al. 1999e,f). The easternmost of the fault zones marks the east boundary of the graben (a down-dropped block of crust) that forms the Joes Valley. The second fault zone west of the boundary fault is internal to the graben structure. Both sets of faults zones are believed to have been active within the last 15,000 years and would be considered potentially active. The faults described above have been assigned potential maximum magnitudes that range from 6.6 to 7.5, the largest potential magnitude for the Joes Valley east and mid-valley faults (Black et

al. 1999e,f; UGS 2011b). Alternative II-B also crosses the Levan Segment of the Wasatch fault zone and the Sugarville area faults, which are considered to be potentially active. Implementation of mitigation measure **GE-1** would reduce the risk due to potentially active faults.

Alternative II-B crosses the North Horn formation. Its potential for subsidence is discussed in Alternative II-A. Implementation of mitigation measure **GE-1** would decrease the potential risk due to subsidence.

Another subsidence hazard is posed by underground coal mines. Alternative II-B crosses the permit area of the Deer Creek Mine about 10 miles northwest of Huntington, Utah (Townships 16 and 17 South and Ranges 6 and 7 East) (UDOGM 2012b). The mine utilizes the longwall mining method, which controls surface subsidence in comparison to other mining methods (Ismaya 2010). Subsidence has been monitored over mining areas since the early 1980s (Energy West Mining Company 2010). As many as 28 areas were monitored over this period of time, but a number of areas are not actively being monitored because subsidence has occurred to its ultimate extent or little or no subsidence was detected. However, subsidence in some areas has been as much as 17 feet where dual seam mining occurred. In addition to modern mining, there are historic underground mines within the permit area.

The Alternative II-B 2-mile transmission line corridor crosses the southeast portion of the Deserado Mine permit area in northwest Colorado (BLM 2011). Implementation of mitigation measure **GE-1** would reduce or eliminate impacts to crossing an active mine permit area. Sinkholes also have been associated with the North Horn Formation in the Wasatch Plateau. In 1954, mastodon, horse, and bison bones were discovered in a sinkhole in the North Horn formation about 2 miles west of Huntington Reservoir (Gillette and Miller 1999). This sinkhole was reported to be 13 feet deep and was probably instrumental in trapping the animals whose fossilized remains were found in the sinkhole. The sinkhole-fossil locality is only about 5 to 6 miles north of Alternative II-B on the west side of the Wasatch Plateau and about 10 miles east of Mount Pleasant, Utah.

Alternative II-B may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. Where the 2-mile transmission line corridor crosses these old shorelines, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented to protect potential fossil resources.

Key Parameters Summary

There is an elevated risk that landslide areas crossed by Alternative II-B might result in damage to facilities or interruption of service during the operation of the Project. Seismicity and subsidence risks also are present, but would not be expected to result in damage to facilities or interruption of service during the operation of the Project. Fifteen oil and gas fields are crossed that might result in mineral resource access conflicts. Approximately 15 miles of coal mine permit areas are crossed. The Alternative II-B 2-mile transmission line corridor crosses the Deserado Mine permit area in northwest Colorado and also crosses the Deer Creek Coal mine permit area in Utah. Approximately 74 miles of PFYC Class 5 formations are crossed, which have an elevated risk for impacting fossil resources.

Alternative II-C

Between the towns of Emery and Salina, Utah, Alternate II-C roughly follows Interstate 70. Where the 2-mile transmission line corridor is south of the interstate it crosses areas of landslide deposits that can be shallow or deep and include talus, rock-fall, colluvium, and soil creep deposits (Elliott and Harty 2010). The alternative also crosses areas of high landslide risk in the Baxter Pass area in western Garfield County, Colorado where the route follows the Baxter Pass Road. Landslides have occurred on steep slopes underlain by sandstones, siltstones, and shales of the Green River and Mesaverde formations (Stover 1985). Implementation of mitigation measure **GE-1** would lessen the risks of landslides.

The proposed Alternative II-C crosses potentially active faults along the east side of the Pavant Range (Maple Grove, Pavant, and Scipio faults) and northward into the Scipio Valley (Scipio Valley faults) (Black et al. 2004b,c,d,e). These faults trend north-south and all appear to have movement within the last 15,000 years. Further north, The Lynndyl Alternative Connector crosses the Little Valley fault zone where generally north trending faults occur on the east and west sides of the valley (Black et al. 1999g). Offset of valley alluvial deposits indicate movement in the last 15,000 years. Latest evidence indicates that the Pavant, Scipio, Scipio Valley, and Little Valley faults may be part of the same continuous fault zone (UGS 2011b). The faults described above have not been assigned potential maximum magnitudes (Petersen et al. 2008; UGS 2011b). Alternative II-C also crosses the Levan Segment of the Wasatch fault zone and the Sugarville area faults, which are considered to be potentially active. Implementation of mitigation measure **GE-1** would reduce impacts due to potentially active faults.

The Manti Landslide location is less than 30 miles north of Alternative Route II-C where the route follows Interstate Highway 70 between Emery and Salina, Utah. This alternative generally follows the route of a transmission line that was heavily damaged in 1983 due to instability from heavy precipitation and runoff and portions of the line had to be relocated to more stable ground (Smith 2011). Mitigation measure **GE-1** would reduce the risk of damage or interruptions of service; however there would remain an elevated risk that a landslide in this area might result in damage to facilities or interruption of service during the operation of the Project.

Ground subsidence risk also is present in the North Horn formation. The upper part of the North Horn Formation contains limestone that may be subject to dissolution resulting in the development of sinkholes. The Flagstaff Limestone, which lies above and may interfinger with the North Horn formation, also may be subject to dissolution (Bjorkland and Robinson 1968; Lawton et al. 1993). Sinkholes in the southern Scipio Valley have been attributed to groundwater solution of North Horn carbonates and Flagstaff Limestone beneath valley fill deposits. The sinkholes occur on the surface traces of the Scipio Valley faults. Bjorkland and Robinson (1968) postulated that groundwater migrated into fractures in the North Horn and Flagstaff Limestone bedrock and dissolved the carbonate layers. The sinkholes developed as the surface manifestation of the dissolution. The North Horn formation and Flagstaff Limestone exposed on the east side of the Scipio Valley were observed to be heavily fractured with evidence of solution. The sinkholes in the Scipio Valley were described to be up to 25 feet deep, 30 feet wide, and 200 feet long and some may have been interconnected by voids in the subsurface. The sinkholes appear to be just east of the Alternative II-C 2-mile transmission line corridor, but present-day Interstate 15 appears to cross the areas where sinkholes were identified on the geologic map accompanying the USGS report by Bjorkland and Robinson (1968).

Alternative II-C crosses the North Horn formation with its potential for subsidence is discussed in Alternative II-A. Alternative II-C 2-mile transmission line corridor encroaches on the southern and eastern edges of the Emery Deep Coal Mine located in Township 22 South, Range 6 East 4.0 miles south of Emery, Utah (UDOGM 2012b). The mine has been operated intermittently since the 1970s and re-opened in 2005 using the continuous mining method (Consolidation Coal Company 2010; Vanden Berg 2010). Expected subsidence magnitude ranges from 1 to 3.5 feet. Alternative II-C 2-mile transmission line corridor crosses the Deserado Mine permit area in northwest Colorado. Mitigation measure **GE-1** would decrease the potential risk of subsidence due to coal mining.

Alternative II-C may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines.

Key Parameters Summary

There is an elevated risk that landslide areas crossed by Alternative II-C might result in damage to facilities or interruption of service during the operation of the Project. Seismicity and subsidence risks also are present, but would not be expected to result in damage to facilities or interruption of service during the operation of the Project. Fifteen oil and gas fields are crossed that might result in mineral resource access conflicts. Approximately 6 miles of coal mine permit areas are crossed. Additionally, 77 miles of PFYC Class 5 formations are crossed, which have an elevated risk for impacting fossil resources.

Alternative II-D

Alternative II-D crosses areas of mapped landslides and landslide prone areas. The 2-mile transmission line corridor also crosses oil and gas fields and active and inactive underground coal mining areas. The active mine permit areas include the Skyline Mine (located in portions of Townships 12, 13, and 14 South; Range 6 East) and the Horizon Mine (located in Township 13 South; Range 8 East) (UDOGM 2012b). The alternative also crosses the Willow Creek Mine area (located in Townships 12 and 13 South; Ranges 9 and 10 East) which was closed in September 2002 and is undergoing reclamation. Associated with the active mines mentioned above are also areas of historic mining and future potential development areas (BLM 2008d).

The Alternative II-D 2-mile transmission line corridor lies just north of the Deserado Mine permit area and may encroach upon lease by application and proposed mining areas (BLM 2011). Also, there are historic coal mines within or adjacent to the corridor northwest of the Deserado Mine in Township 3 North, Range 102 West (Carroll 2006). Implementation of mitigation measure **GE-1** would lower the risk of encountering subsidence from active or historic mining.

Alternative II-D crosses the Levan Segment of the Wasatch fault zone and the Sugarville area, which are considered to be potentially active. The alternative also crosses landslide prone areas of the Wasatch Plateau. Implementation of mitigation measure **GE-1** would lessen the risks of seismicity and landslides.

Alternative II-D may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines.

Key Parameters Summary

There is an elevated risk that landslide areas crossed by Alternative II-D might result in damage to facilities or interruption of service during the operation of the Project. Seismicity and subsidence risks also are present, but would not be expected to result in damage to facilities or interruption of service during the operation of the Project. Nine oil and gas fields are crossed and active and inactive coal mine areas are crossed that might result in mineral resource access conflicts. Additionally, 129 miles of PFYC Class 5 formations are crossed, which have an elevated risk for impacting fossil resources.

Alternative II-E

Alternative II-E crosses areas of mapped landslides and landslide prone areas. The alternative crosses the Levan Segment of the Wasatch fault zone and the Sugarville area faults, which are considered to be potentially active. Implementation of mitigation measure **GE-1** would lower the risk of landslides and seismicity.

The 2-mile transmission line corridor crosses 5 oil and gas fields in Colorado and Utah.

The Alternative II-E 2-mile transmission line corridor lies just north of the Deserado Mine permit area and may encroach upon lease by application and proposed mining areas (BLM 2011). Also, there are historic coal mines within or adjacent to the corridor northwest of the Deserado Mine in Township 3 North, Range 102 West (Carroll 2006). Implementation of mitigation measure **GE-1** would lower the risk of encountering subsidence from active or historic mining.

Alternative II-E may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines.

Key Parameters Summary

There is an elevated risk that landslide areas crossed by Alternative II-E might result in damage to facilities or interruption of service during the operation of the Project. Seismicity and subsidence risks also are present, but would not be expected to result in damage to facilities or interruption of service during the operation of the Project. Five oil and gas fields are crossed that might result in mineral resource access conflicts. No coal mine permit areas are crossed. Additionally, 113 miles of PFYC Class 5 formations are crossed, which have an elevated risk for impacting fossil resources.

Alternative II-F (Agency Preferred)

Alternative II-F crosses landslide prone areas of the Wasatch Plateau including the Thistle landslide area. The alternative crosses the Levan Segment of the Wasatch fault zone and the Sugarville area faults, which are considered to be potentially active. Implementation of mitigation measure **GE-1** would lower the risk of impacts due to landslides and seismicity.

The 2-mile transmission line corridor crosses 9 oil and gas fields in Colorado and Utah.

Alternative II-F 2-mile transmission line corridor lies just north of the Deserado Mine permit area and may encroach upon lease by application and proposed mining areas (BLM 2011). Also, there are historic coal mines within or adjacent to the corridor northwest of the Deserado Mine in Township 3 North, Range 102 West (Carroll 2006). Implementation of mitigation measure **GE-1** would lower the risk of encountering subsidence from active or historic mining.

Alternative II-F may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines.

Key Parameters Summary

There is an elevated risk that landslide areas crossed by Alternative II-F might result in damage to facilities or interruption of service during the operation of the Project. Seismicity and subsidence risks also are present, but would not be expected to result in damage to facilities or interruption of service during the operation of the Project. Seven oil and gas fields are crossed that might result in mineral resource access conflicts. No coal mine permit areas are crossed. Additionally, 156 miles of PFYC Class 5 formations are crossed, which have an elevated risk for impacting fossil resources.

Cedar Knoll Micro-siting Options 1 and 2

The geologic formations crossed by the Cedar Knoll micro-siting options 1 and 2 would not differ substantially from Alternative II-A. The micro-siting options would not pose a greater risk to paleontological or mineral resources or increased risk from geologic hazards.

Alternative Variation in Region II

Emma Park Alternative Variation

The geologic formations crossed by the Emma Park Alternative Variation would not differ substantially from Alternatives II-E and II-F. The alternative variation would not pose a greater risk to paleontological or mineral resources or increased risk from geologic hazards.

Alternative Connectors in Region II

The Lynndyl Alternative Connector crosses the Scipio and Little Valley faults, which increases the risk to seismic hazards. The connector also crosses an area susceptible to sinkholes in the south end of the Scipio Valley.

Table 3.2-14 summarizes impacts associated with the alternative connectors in Region II.

Table 3.2-14 Summary of Region II Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Highway 191 Alternative Connector	There are no identified geologic hazards; no mineral resources; and the connector crosses 3 miles of Class PFYC 5 formations.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Castle Dale Alternative Connector	There are no identified geologic hazards; no mineral resources; and no Class 4 or 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Price Alternative Connector	There are no identified geologic hazards; no mineral resources; and no Class 4 or 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Lynndyl Alternative Connector (Alternatives II-B and II-C)	Scipio and Little Valley faults increase seismic risk; low landslide risk; higher subsidence risk; 2 miles of Class 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
IPP East Alternative Connector (Alternatives II-A and II-B)	There are no identified geologic hazards; no mineral resources; and no Class 5 PFYC formations crossed. Crosses less than 1 mile of Lake Bonneville deposits.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.

Region II Conclusion

There is some variability between the Region II alternative corridors in terms of geologic hazards although all cross active fault zones, areas of moderate to high landslide risk, and potential subsidence areas (**Table 3.2-13**). Alternative II-C crosses as many as five active fault zones and is potentially the most impacted by seismicity. Alternatives II-D, II-E, and II-F each cross 2 active fault zones. All of the alternatives cross historic coal mining areas that may pose ground subsidence hazards. Potential impacts to minerals also vary. All the alternatives cross oil and gas fields, but alternatives II-B and II-C cross 15 oil and gas fields, more than twice the number of the other alternatives and may be subject to more siting conflict impacts depending on well spacing and density of related surface facilities. All of the alternatives cross active coal mining areas in Colorado and Utah.

Alternative II-A and II-D may pose greater impacts to paleontological resources in Class 3 and Class 4 formations. Alternative II-A crosses 120 miles of Class 5 formations and Alternative II-D crosses 129 miles of Class 5 formations. Alternative II-F poses the most impact risk to paleontological resources.

There are no appreciable differences between the alternative connectors (**Table 3.2-14**) except the Lynndyl Alternative Connector which crosses potentially active fault zones, an area of sinkhole susceptibility, and 2 miles of PFYC rank 5 formations. The other connectors have no identified concerns for geologic hazards, mineral resources, or paleontological resources.

The micro-siting consideration for the Strawberry IRA would not pose unique opportunities or constraints for Alternate II-A Corridor. The micro-siting consideration for the Cedar Knoll IRA would not pose unique opportunities or constraints for Alternate II-A, II-E, and II-F corridors.

3.2.6.5 Region III

Project construction, operation, and decommission impacts in Region III would be the same as those discussed in Section 3.2.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.2-15** provides a comparison of impacts associated with the alternative routes in Region III.

Table 3.2-15 Summary of Region III Alternative Route Impacts

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Seismicity	Two active fault zones identified (Escalante Desert Faults and California Wash Fault), low ground motion potential.	One active fault zone identified (Escalante Desert Faults), low ground motion potential.	One active fault zone identified (Escalante Desert Faults), slightly elevated ground motion potential in Lincoln County, Nevada. Potential risk from ground fissures in Dry Lake and Delamar valleys.
Landslides	Landslides pose a slight risk.	Same as Alternative III-A.	Same as Alternative III-A.
Subsidence	Risk of abandoned mine hazards including subsidence associated with historic metal mining, southwest of Milford, Utah.	Same as Alternative III-A.	Same as Alternative III-A.
Mineral Resources	2-mile transmission line corridor crosses near or over the Milford Ballast Rock Quarry and the CS Mining Hidden Treasure copper mine northwest of Milford, Utah. Crosses sand and gravel mining areas in Clark County, Nevada.	Same as Alternative III-A.	Same as Alternative III-A.
Paleontological Resources	PFYC Class 3: 21 miles Class 4: 1 mile Class 5: 4 miles	PFYC Class 3: 12 miles Class 4: 0 miles Class 5: 1 mile	PFYC Class 3: 9 miles Class 4: 0 miles Class 5: 1 mile

<u>Alternative III-A (Applicant Proposed)</u>

The Alternative III-A 2-mile transmission line corridor crosses the Escalante Desert Faults, which are located southeast of the Union Pacific railroad tracks near Thermo siding. The normal faults trend generally to the northeast and cut alluvium and lake sediments (Black and Hecker 1999). It is not certain if these faults extend deeply enough into the subsurface to be considered potential sources for earthquakes. This 2-mile transmission line corridor also crosses the California Wash Fault just west of Moapa, Nevada

and the 2-mile transmission line corridor essentially is coincident with the fault zone for about 10 miles along the western flank of Northern Muddy Mountains. The California Wash Fault is a normal fault with the downthrown side to the west (Anderson 1999a). The fault forms the boundary between the basin where California Wash is located and the Muddy Mountains. The deposits cut by the fault indicated movement within the last 15,000 years so the fault is considered to be active.

In most areas covered by the proposed routes in Region III, in a 500-year period, ground motion would range from less than 10 percent of **g** to about 16 percent of **g** in parts of southern Lincoln County, Nevada. Ground motions between 10 and 20 percent of **g**, as shown on **Table 3.2-9**, are not expected to cause damage to well engineered structures. Ground motion risk would be low for Alternative III-A.

The Applicant Proposed Alternative has a slight risk of landslides in western Washington County, Utah, where there is a moderate susceptibility to landslides.

In the Escalante Desert of southwest Utah a potential subsidence hazard has developed as a result of decades of groundwater pumping that has resulted in the formation of earth fissures and subsidence of the ground surface (Lund et al 2005). In the area around Beryl Junction in the southern part of the valley, subsidence has lowered the ground surface by as much as 100 feet and earth fissures have accompanied the subsidence. The north-trending fissures were centered around Beryl Junction and range from 300 to 1300 feet in length. The subsidence and fissuring around Beryl does not appear to pose a concern for the proposed routes since the routes are located at the edges of the valley. Even though subsidence is slight as compared to the maximum (a few inches compared to 100 feet), the hazard does present a risk in this area and mitigation measure **GE-1** should be implemented.

Northeast and southwest of Newcastle, Utah ground cracks have been observed but are believed to be large desiccation cracks and are not related to the groundwater withdrawal except during initial stages of dewatering of the shallow water table when large-scale pumping began over 50 years ago (Lund et al 2005). The Alternative III-A lies near or on areas of ground cracking in the Newcastle area, but based on the conclusion regarding the origin of these cracks (Lund et al. 2005), they do not appear to pose a concern.

Alternative III-A may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines.

Alternative III-A crosses an area of active mining northwest of Milford, Utah in Township 27 South, Range 11 West in the Rocky Range, the northern extension of the historic Star Mining District and sometimes referred to as the North Star district (Butler 1913). The Star and North Star Districts historically produced precious and base metals including gold, silver, copper, and lead beginning in 1870. There are 2 active mines in the Rocky Range portion of the district, one produces crushed rock for railroad ballast (Milford Ballast Rock Quarry; Sections 10, 11, 12, 14, and 15) and the other is a copper mine (CS Mining Hidden Treasure copper mine, sections 7, 8, 17, 20, 21, 22, 28, and 34). In addition to crossing these active mining areas, the alternative crosses abandoned mine areas in the district, some of which have been reclaimed (Gallegos 2009). Notwithstanding the reclamation work in the Star District, there may still be areas of exposed adits and shafts and potential subsidence associated with un-reclaimed mines in the Star District in Townships 27 and 28 South, Range 11 West. Mitigation measure **GE-1** should be implemented in the areas described above to lessen potential conflicts with active mining and to determine the subsidence potential.

The Alternative III-A corridor crosses historic and active mineral districts in Lincoln and Clark Counties, Nevada, but it does not cross active mining areas. The corridor is close to but would not cross the Apex Mine located near the intersection of I-15 and SH 93, in Clark County, Nevada.

Key Parameters Summary

Alternative III-A would cross two fault zones, one area of increased landslide potential, and an area of subsidence due to groundwater withdrawal. None of these would be expected to result in damage to facilities or interruption of service during the operation of the Project. No oil and gas fields are crossed that might result in access conflicts. However there are active and historic mining areas that are crossed near Milford, Utah, which could pose mineral access issues and hazards associated with historic mining. The alternative corridor does not cross active mining areas in Nevada. About 4 miles of high PFYC (Class 5) formations are crossed, therefore crossing these formations constitutes a high risk of loss or damage to scientifically important paleontological resources.

Alternative III-B (Agency Preferred)

The Alternative III-B 2-mile transmission line corridor crosses the north end of the California Wash Fault, but the route's southwest direction across the valley takes it away from the fault. The corridor also crosses the Escalante Desert Faults, which are considered active.

A subsidence area in the Escalante Desert that may possibly affect the Alternative III-B has been documented along the railroad tracks southwest of Milford, Utah. The 2-mile transmission line corridors parallel the railroad tracks in the area and cross areas of subsidence. Maximum subsidence in this area was measured at slightly more than 1.5 inches from 1993 to 1998 in an area southwest of Milford, Utah (Forster 2006). Even though subsidence is slight as compared to the maximum (a few inches compared to 100 feet), the hazard does present a risk in this area and mitigation measure **GE-1** should be implemented.

Alternative III-B may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines.

Alternative III-B crosses an area of active mining northwest of Milford, Utah in Township 27 South, Range 11 West in the Rocky Range, the northern extension of the historic Star Mining District and sometimes referred to as the North Star district (Butler 1913). The Star and North Star Districts historically produced precious and base metals including gold, silver, copper, and lead beginning in 1870. There are 2 active mines in the Rocky Range portion of the district, one produces crushed rock for railroad ballast (Milford Ballast Rock Quarry; Sections 10, 11, 12, 14, and 15) and the other is a copper mine (CS Mining Hidden Treasure copper mine, sections 7, 8, 17, 20, 21, 22, 28, and 34). In addition to crossing these active mining areas, the 2-mile transmission line corridor crosses abandoned mine areas in the district, some of which have been reclaimed (Gallegos 2009). Notwithstanding the reclamation work in the Star District, there may still be areas of exposed adits and shafts and potential subsidence associated with un-reclaimed mines in the Star District in Townships 27 and 28 South, Range 11 West.

Alternative Corridor III-B crosses or is near historic mining districts in Lincoln County (Acoma, Vigo, Gourd Springs), but does not cross active mining areas in the county. The corridor may cross or encroach upon an active sand and gravel operation (Moapa Redi-Mix, Township 14 South, Range 66 East) on the north side of Moapa, Nevada (Hess and Davis 2010). The corridor is close to but would not cross the Apex Mine located near the intersection of I-15 and SH 93, in Clark County, Nevada.

Mitigation measure **GE-1** should be implemented to reduce potential conflicts with active mining and to determine the subsidence potential in historic underground mining areas.

Key Parameters Summary

Alternative III-B would cross one fault zone and one area of slight subsidence risk. Geologic hazards would not be expected to result in damage to facilities or interruption of service during the operation of the Project. No oil and gas fields would be crossed. However there are active and historic mining areas that are crossed near Milford, Utah, which could pose mineral access issues and hazards associated with historic mining. The corridor crosses near a sand and gravel operation near Moapa, Nevada. One mile of formations with high PFYC classifications (Class 5) would be crossed.

Alternative III-C

The Alternative III-C 2-mile transmission line corridor crosses the Escalante Desert Faults, considered to be active (USGS 2006). The corridor also crosses areas of ground fissures located in the southern Delamar Valley and the northern Dry Lake Valley (Swadley 1995). The origin of the fissures is not certain but is thought to either be tectonic or from subsidence. There is evidence that the fissures on the north end of Dry Lake Valley are active whereas the fissures at the south end of the Delamar Valley are inactive. Implementation of mitigation measure **GE-1** would reduce the risk of impacts where Alternative III-C crosses the fissures in Dry Lake and Delamar valleys and the Escalante Desert Faults.

The same subsidence feature southwest of Milford, Utah, and discussed in Alternative III-B, may affect Alternative III-C. Even though subsidence is slight as compared to the maximum (a few inches compared to 100 feet), the hazard does present a risk in this area and mitigation measure **GE-1** should be implemented.

Alternative III-C may cross relict shorelines and associated deposits from Lake Bonneville. While these deposits have a PFYC rating of 2, scientifically important fossils have been found in sand and gravel deposits associated with the old shorelines. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these old shorelines.

The BLM-managed Oak Springs Summit Trilobite Area is within the Alternative III-C Corridor. A transmission line and facilities built within the corridor must be in accordance with BLM rules concerning stand-offs or buffers from such protected areas.

Alternative III-C crosses an area of active mining northwest of Milford, Utah in Township 27 South, Range 11 West in the Rocky Range, the northern extension of the historic Star Mining District and sometimes referred to as the North Star district (Butler 1913). The Star and North Star Districts historically produced precious and base metals including gold, silver, copper, and lead beginning in 1870. There are 2 active mines in the Rocky Range portion of the district, one produces crushed rock for railroad ballast (Milford Ballast Rock Quarry; Sections 10, 11, 12, 14, and 15) and the other is a copper mine (CS Mining Hidden Treasure copper mine, sections 7, 8, 17, 20, 21, 22, 28, and 34). In addition to crossing these active mining areas, the 2-mile transmission line corridor crosses abandoned mine areas in the district, some of which have been reclaimed (Gallegos 2009). Notwithstanding the reclamation work in the Star District, there may still be areas of exposed adits and shafts and potential subsidence associated with un-reclaimed mines in the Star District in Townships 27 and 28 South, Range 11 West. Mitigation measure **GE-1** should be implemented in the areas described above to lessen potential conflicts with active mining and to determine the subsidence potential.

Alternative Corridor III-C may cross areas of historic mining in Lincoln County Nevada, but would not cross active mine areas. The corridor is close to, but would not cross, the Apex Mine located near the intersection of I-15 and SH 93, in Clark County, Nevada.

Key Parameters Summary

Alternative III-C would cross one area of slight subsidence risk. Geologic hazards would not be expected to result in damage to facilities or interruption of service during the operation of the Project. No oil and gas fields would be crossed. However there are active and historic mining areas that are crossed near Milford, Utah, which could pose mineral access issues and hazards associated with historic mining. The alternative corridor does not cross active mining areas in Nevada. One mile of formations with high PFYC classifications (Class 5) would be crossed.

Alternative Variations in Region III

The Ox Valley East and West alternative variations both cross short areas of elevated PFYC classifications. Through implementation of BMPs and design options discussed in Section 3.2.4.2, Impacts Common to All Alternative Routes and Associated Components, no damage or loss to scientifically important paleontological resources is expected.

Table 3.2-16 provides a comparison of impacts associated with the alternative variations in Region III.

Table 3.2-16 Summary of Region III Alternative Variation Impacts

Alternative Variation	Analysis
Ox Valley East Alternative Variation (Alternative III-A)	2 miles of PFYC Class 5 formations would be crossed by Ox Valley East compared to 1 mile of Class 5 formations crossed by Alternative III-A that it would replace. Moderate landslide susceptibility, no other geologic hazard.
Ox Valley West Alternative Variation (Alternative III-A)	The Ox Valley West Alternative would cross no PFYC Class 5 formations compared to 1 mile of Class 5 formations crossed by Alternative III-A which it would replace. Moderate landslide susceptibility, no other geologic hazard.
Pinto Alternative Variation (Alternative III-A)	The Pinto Valley Alternative Variation would cross 3 miles of PFYC Class 5 formations compared to 1 mile of Class 5 formations crossed by Alternative III-A which it would replace. Moderate landslide susceptibility, no other geologic hazard.

Alternative Connectors in Region III

There are no identified geologic hazards or mineral resources associated with the Moapa Alternative Connector. The connector does cross less than 1 mile of undivided Moenkopi and Thaynes Formations. The Moenkopi is considered to be PFYC 3, a moderate potential for paleontological resources.

Table 3.2-17 summarizes impacts associated with the alternative connectors in Region III.

Table 3.2-17 Summary of Region III Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Avon Alternative Connector	There are no identified geologic hazards; no mineral resources; and no Class 4 or 5 PFYC formations crossed.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Moapa Alternative Connector	There are no identified geologic hazards; no mineral resources; and does not cross PFYC Class 3 or 5 formations.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector except for very low risk to fossil resources.

Alternative Ground Electrode Systems in Region III

The southern ground electrode system would be necessary within 100 miles of the southern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided in the project POD. The impacts associated with constructing and operating this system are the same as discussed for Alternative I-A. **Table 3.2-18** summarizes impacts associated with the eight combinations of alternative route and location possibilities for the southern ground electrode system.

Table 3.2-18 Summary of Region III Alternative Ground Electrode System Impacts

Ground Electrode System Name	Analysis
Mormon Mesa-Carp Elgin Rd (Alternative III-A)	Area may include Muddy Creek Formation PFYC 3. No impacts regarding geological hazards or mineral resources.
Halfway Wash-Virgin River (Alternative III-A)	Impacts would be the same as Mormon Mesa Elgin Rd (Alternative III-A).
Halfway Wash East (Alternative III-A)	Impacts would be the same as Mormon Mesa Elgin Rd (Alternative III-A).
Mormon Mesa-Carp Elgin Rd (Alternative III-B)	Impacts would be the same as Mormon Mesa Elgin Rd (Alternative III-A).
Halfway Wash-Virgin River (Alternative III-B)	Impacts would be the same as Mormon Mesa Elgin Rd (Alternative III-A).
Halfway Wash East (Alternative III-B)	Impacts would be the same as Mormon Mesa Elgin Rd (Alternative III-A).
Meadow Valley 1 (Alternative III-C)	Impacts would be the same as Mormon Mesa Elgin Rd (Alternative III-A).

Region III Conclusion

There are no appreciable differences between alternatives in Region III except for a slightly higher seismic risk for Alternative Corridor III-A which crosses 2 potentially active fault zones compared to one fault zone for the other alternatives (**Table 3.2-15**). There are no appreciable differences between the alternative variations (**Table 3.2-16**), the alternative connectors (**Table 3.2-17**), and the ground electrode system alternative (**Table 3.2-18**).

3.2.6.6 Region IV

Project construction, operation, and decommission impacts in Region IV would be the same as those discussed in Section 3.2.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.2-19** provides a comparison of impacts associated with the alternative routes in Region IV.

Table 3.2-19 Summary of Region IV Alternative Route Impacts

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Seismicity	May cross or is near potentially active faults; low ground motion potential.	Same as Alternative IV-A.	Same as Alternative IV-A.
Landslides	Generally low incidence and moderate susceptibility.	Same as Alternative IV-A.	Same as Alternative IV-A.
Subsidence	Does not cross areas that have subsided due to groundwater withdrawal. Low potential for karst areas.	Same as Alternative IV-A.	Same as Alternative IV-A.
Mineral Resources	Crosses sand and gravel and gypsum mining areas in Clark County, Nevada. No oil and gas.	Same as Alternative IV-A.	Same as Alternative IV-A.

Table 3.2-19 Summary of Region IV Alternative Route Impacts

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Paleontological Resources	PFYC Class 3: 9 miles; no Class 4 or 5 crossed.	PFYC Class 3: 1 mile; no Class 4 or 5 crossed.	PFYC Class 3: 1 mile; no Class 4 or 5 crossed.

Alternative IV-A (Applicant Proposed and Agency Preferred)

The Alternative IV-A 2-mile transmission line corridor would not be expected to be impacted by landslides or subsidence. It does not cross subsidence areas that have been documented in the Las Vegas area. The corridor crosses the Las Vegas shear zone. It may also cross the south end of the Black Hills fault, but it is not certain because the fault is difficult to define south of the Black Hills where the fault is buried by valley deposits (Zaragoza 2008). Implementation of mitigation measure **GE-1** would reduce or eliminate potential impacts with regard to the potentially active faults and mineral conflicts. The route would cross 9 miles of moderate PFYC (Class 3) formations, but no Class 4 or 5 formations. However, to protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these formations.

Alternative IV-B

The Alternative IV-B 2-mile transmission line corridor would not be expected to be impacted by landslides or subsidence. It does not cross areas of subsidence that have been documented in the Las Vegas area. The corridor crosses the Las Vegas shear zone. Southeast of the Black Hills, the corridor parallels the Black Hills fault, but does not cross the fault and would therefore be subjected to ground motion if a strong earthquake was generated along the fault. The corridor may cross areas of mineral potential in the Las Vegas mineral district and it may cross or encroach upon the PABCO mine. Implementation of mitigation measure **GE-1** would reduce or eliminate potential impacts with regard to the potentially active faults and mineral conflicts. The route would cross 1 mile of moderate PFYC (Class 3) formations, but no Class 4 or 5 formations. However, to protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these formations.

Alternative IV-C

The Alternative IV-C 2-mile transmission line corridor would not be expected to be impacted by landslides or subsidence. It does not cross areas of subsidence that have been documented in the Las Vegas area. The corridor crosses the Las Vegas shear zone, but the corridor does not cross the Black Hills fault and would therefore be subjected to ground motion if a strong earthquake was generated along the fault. The corridor may cross areas of mineral potential in the Las Vegas mineral district and it may cross or encroach upon the PABCO mine. Implementation of mitigation measure **GE-1** would reduce or eliminate potential impacts with regard to the potentially active faults and mineral conflicts. The route would cross less than 1 mile of moderate PFYC (Class 3) formations, but no Class 4 or 5 formations. No mineral resources would be crossed. To protect potential fossil resources, it is recommended that BMPs PAL-1 through PAL-5 and design options TWE-4, TWE-38, and TWE-39 be implemented where the 2-mile transmission line corridor crosses these formations.

Alternative Variations in Region IV

The Marketplace Alternative Variation would not be expected to be impacted by landslides or subsidence. Southeast of the Black Hills, the corridor parallels the Black Hills fault, but does not cross the fault and would therefore be subjected to ground motion if a strong earthquake was generated along the fault.

Implementation of mitigation measure **GE-1** would reduce or eliminate potential impacts with regard to the potentially active Black Hills fault. No mineral resources would be crossed that might result in loss of economic value or access conflicts. No formations with PFYC classifications greater than 2 would be crossed, therefore no loss or damage to scientifically important paleontological resources is expected.

Table 3.2-20 provides a comparison of impacts associated with the alternative variation in Region IV.

Table 3.2-20 Summary of Region IV Alternative Variation Impacts

Alternative Variation	Analysis
Marketplace Alternative Variation (Alternative IV-B)	Potential seismic hazards due to Black Hills Fault. No impacts to mineral or paleontological resources.

Alternative Connectors in Region IV

None of the alternative connectors would be expected to be impacted by seismicity, landslides, or subsidence that results in damage to facilities or interruption of service. No mineral resources would be crossed that might result in loss of economic value or access conflicts. No formations with PFYC classifications greater than 2 would be crossed except for the Sunrise Mountain Alternative Connector, which would cross 3 miles of the Class 3 Horse Spring Formation.

Table 3.2-21 summarizes impacts associated with the alternative connectors in Region IV.

Table 3.2-21 Summary of Region IV Alternative Connector Impacts

Alternative Connector	Analysis	Advantage
Sunrise Mountain Alternative Connector	There are no identified hazards or mineral resources. Crosses 3 miles of Class 3 Horse Spring Formation.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector except for very slight increase in risk to fossil resources.
Lake Las Vegas Alternative Connector	There are no identified hazards, mineral resources, or paleontological resources.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Three Kids Mine Alternative Connector	The alternative connector crosses the abandoned Three Kids Mine area that may present hazards including unstable tailing and waste rock piles, steep slopes, and open pits. No other issues identified with regard to minerals or paleontological resources.	The Three Kids Mine presents concerns about the use of this connector route and therefore is a disadvantage to the use of this connector route. Potential contamination risks present a strong disadvantage for this route which may not be mitigated by implementation of mitigation measure **GE-1**.
River Mountains Alternative Connector	There are no identified hazards, mineral resources, or paleontological resources.	There are no apparent unique opportunities or constraints for geologic resources by utilizing this connector.
Railroad Pass Alternative Connector (Alternatives IV-A and IV-B)	The connector may cross or is immediately adjacent to the Black Hills Fault. The connector may cross or encroach upon active sand and gravel mining pits just south of Railroad Pass between SH 93 and the Black Hills. No issues identified for paleontological resources.	Proximity to the potentially active Black Hills Fault may present a disadvantage. Potential seismicity and mineral concerns can be reduced by implementation of mitigation measure **GE-1**.

Region IV Conclusions

There are no distinct differences between the alternatives in Region IV concerning potential impacts due to geologic hazards, mineral resources, and paleontological resources (**Table 3.2-19**). The Marketplace Variation does not present an advantage over Alternative IV-B. There are concerns with hazards and potential contamination for the Three Kids Mine Alternative Connector that place it at a disadvantage as compared to the other connectors in the region. Although the Railroad Pass Connector is close to the potentially active Black Hills Fault, potential impacts are similar to seismic impacts for the alternatives that cross or are adjacent to the fault. The Railroad Pass Connector also may cross or encroach upon gravel mining operations south of Railroad Pass in the end of the El Dorado Valley.

3.2.6.7 Residual Impacts

Geologic Hazards

Although geotechnical design measures would reduce the risk from geological hazards, there is a small risk of damage to facilities in the event of a major geologic event such as a large magnitude earthquake or a landslide the size of the Thistle landslide. The most highly effective mitigation is recognition and avoidance of the particular hazard (Lund et al. 2009). If avoidance is not possible then engineering solutions must be implemented with the awareness that although the risk may be reduced, the engineering solutions cannot totally eliminate the risk, especially for major events.

Paleontological Resources

Even if BMPs and design options are implemented, some scientifically valuable fossils may be disturbed and lost during construction activities. As a consequence, there would be a small incremental loss of fossil material that would be offset by the material that is recovered and preserved for scientific study purposes. Impacts resulting from unauthorized collection and natural weathering and erosion processes would continue.

Mineral Resources

Proper siting and avoidance of mineral producing sites should reduce potential impacts associated with lack of access to mineral resources. However, it is possible that mineral resources may exist directly underneath the right-of-way and some types of resources would not be practically accessible for the life of the project. The types of mineral resources that would be more affected than others would be near-surface mineral material deposits (e.g., common sand, gravel, and stone). Mineable underground coal deposits under the right-of-way may be subject to reduced recovery since a lower extraction rate may have to be applied to maintain support for surface facilities. Oil and gas resources would be less affected because recovery of the resources would be possible even with a minimum stand-off of 250 feet without having to resort to directional drilling. With directional drilling the right-of-way poses even less of a concern for access.

3.2.6.8 Impacts from the No Action Alternative

Current management across the analysis area would be maintained under the No Action Alternative. Under this alternative, there would be no project construction, operation and maintenance, or decommissioning disturbance to impact or be impacted by geologic hazards, mineral resources, or paleontological resources.

3.2.6.9 Irreversible and Irretrievable Commitment of Resources

Geologic Hazards

There would be no irreversible and irretrievable commitments of resources regarding geologic hazards.

Paleontological Resources

Since paleontological resources are nonrenewable, any impacts would render the resource disturbance irreversible and the integrity of the resource irretrievable.

Mineral Resources

The short term preclusion of access to mineral resources would not constitute an irreversible impact since the resources would not be extracted and consumed. However, the impact would be irretrievable for the operational life of the proposed project.

3.2.6.10 Relationship between Local Short-term Uses and Long-term Productivity

Geological Hazards

There are no relationships between local short-term uses and long-term productivity for geological hazards.

Paleontological Resources

Short-term impacts associated with the exposure of any scientifically important fossils from project activities would not adversely impact the long-term potential for discovery of potential fossil resources.

Mineral Resources

The short term effects are not expected to cause long-term impairment to the productivity of mineral resources.

3.3 Soil Resources

3.3.1 Regulatory Background

Soil resources are managed through a broad set of regulations, guidelines, and formal planning processes. These controls and directions are administered through federal, state, or local units of government. At the federal level, primary land management agencies include the USFS and the BLM. Through state and local agency offices, the Natural Resources Conservation Service (NRCS) administers soil conservation programs on private lands. In addition, the NRCS inventories Prime and Unique Farmlands, as identified in 7 CFR Part 657. These farmlands are of statewide or local importance to crop production. The Farmland Protection Policy Act states that federal programs that contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses will be minimized and shall be administered in a manner that, as practicable, are compatible with state and local government and private programs and policies to protect farmland.

On lands administered by the BLM, the agency addresses soil resources primarily through BLM Handbook H-4810-1, “Rangeland Health Standards,” and by participating as a cooperating agency in the Colorado River Salinity Control Program. The Rangeland Health Standards are based on 43 CFR 4180.1, “Fundamentals of Rangeland Health.” This regulation calls on the BLM to ensure that “watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.” Individual BLM districts and field offices administer these regulations and guidelines, including soil conservation considerations, through RMPs and project-level assessments.

The USFS addresses soil resource management primarily by cooperating in the Colorado River Salinity Control Program and by implanting policy set forth in each Forest or Grassland Plan. Each national forest and grassland is governed by a management plan in accordance with the NFMA. These plans set management, protection and use goals and guidelines. The Forest Service Manual, Soil Management (Chapter 2550) and the Forest Service Handbook, Watershed Conservation Practices Handbook (Chapter 2509.25) specific to each region also provide policy and guidance on managing soil resources.

State conservation laws have been enacted in all of the states that would be traversed by the proposed TWE project. An example is Nevada’s Conservation District Law (Nevada Revised Statutes Chapter 548). Through this type of state legislation, local soil conservation districts (SCDs) have been formed. These report to state administrative agencies, typically conservation commissions associated with state departments. The latter include the Colorado Department of Public Health and Environment, the Nevada Department of Conservation and Natural Resources, the Utah Division of Conservation and Resource Management (within the Department of Agriculture and Food), and the Wyoming Department of Agriculture. The SCDs are responsible for local planning, program development, and reporting in order to administer soil and water conservation programs. They interact with their respective state-level departments as well as the NRCS.

3.3.2 Data Sources

The soil baseline characterization for the proposed project is based on Soil Survey Geographic (SSURGO) database review and analyses. SSURGO is the most detailed level of soil mapping done by the NRCS (NRCS 2010). This investigation focused on soil characteristics or limitations of particular interest to the proposed transmission line construction. The results of the SSURGO data assessment are provided in Section 3.3.4.2, Soil Characteristics. Sensitive soils including prime farmland, hydric, highly erodible, limited revegetation potential, droughty, and landslide prone soils are described in further detail below.

In some cases, USFS soil surveys were available on some USFS lands. Where provided, soil analyses on the Forests were done using USFS specific data.

Locations where SSURGO and USFS soils data were not available, the soils were characterized using the U.S. General Soil Map (GSM). GSM consists of general soil association units. It was developed by the National Cooperative Soil Survey and supersedes the State Soil Geographic (STATSGO) dataset published in 1994. It consists of a broad-based inventory of soils and non-soil areas that occur in a repeatable pattern on the landscape and that can be cartographically shown at the scale mapped.

Information on Major Land Resource Areas (MLRAs) was obtained from the Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin, U.S. Department of Agriculture Handbook 296 (USDA 2006).

3.3.3 Analysis Area

The analysis area for soil resources encompasses the 2-mile-wide transmission line corridor that includes the proposed route and all alternative corridors.

3.3.4 Baseline Description

3.3.4.1 Major Land Resource Areas

Soil resources within the analysis area have formed within eight MLRAs. Generally, from north to south, these include the following (USDA 2006):

- MLRA 34A – Cool Central Desertic Basins and Plateaus;
- MLRA 34B – Warm Central Desertic Basins and Plateaus;
- MLRA 47 – Wasatch and Uinta Mountains;
- MLRA 48A – Southern Rocky Mountains;
- MLRA 29- Southern Nevada Basin and Range;
- MLRA 28A – Great Salt Lake Area;
- MLRA 35 – Colorado Plateau; and
- MLRA 30 – Mojave Desert.

A description of each MLRA follows, including the overall setting and soil types found within each.

<u>MLRA 34A – Cool Central Desertic Basins and Plateaus</u>

The Wyoming portion of this MLRA is bounded on most sides by mountains. The Owl Creek Mountains, the Big Horn Mountains, and the Wind River Range are to the north; the Salt Range and Wasatch Mountains are to the west; and the Laramie and Sierra Madre Mountains are to the east. The part of the MLRA in Colorado is bounded on the south by the Roan Plateau, on the east by the Elkhead Mountains, and on the west by Dinosaur National Monument. In most of the MLRA, elevation ranges from 5,200 feet to 7,500 feet amsl. Small mountainous areas have an elevation as high as 9,200 feet amsl.

The soils in MLRA 34A are generally calcareous and range from shallow or moderately deep to sedimentary bedrock. Alluvial and eolian deposits also are present within the MLRA. Some of the soils formed in slope alluvium or residuum derived from shale or sandstone. Soils that formed in stream- or river-deposited alluvium are near the major waterways. The average annual precipitation is 7 to 12 inches and the freeze-free period ranges from 45 to 160 days. The dominant soil orders in this MLRA are Aridisols and Entisols. Aridisols are well developed soils that have a very low concentration of organic

matter and form in an arid or semi-arid climate. In contrast, Entisols are considered recent soils that lack soil development because erosion or deposition rates occur faster than the rate of soil development.

MLRA 34B – Warm Central Desertic Basins and Plateaus

This MLRA consists of broad intermountain basins bounded by plateaus and steep escarpments. The northern part of the MLRA occurs in the Uinta Basin Section, which is bounded by the Uinta Mountains to the north, the Wasatch Range to the west, the Roan Plateau to the south, and the Rabbit Hills to the east. The southern part of the MLRA occurs in the northern third of the Canyon Lands Section. This section is bounded by the Roan Plateau to the north, the Wasatch Plateau to the west, the southern end of the San Rafael Swell to the south, and the western slope of the Rocky Mountains to the east. Elevation ranges from 4,100 feet near Green River, Utah, to 7,500 feet amsl at the base of the Wasatch Range and the Roan Plateau.

The soils in MLRA 34B generally are calcareous and shallow or moderately deep to sedimentary bedrock. The soils that formed in material weathered from Mancos Shale tend to be saline and high in selenium. Cretaceous shales often weather to form expansive clays that are prone to shrink swell (expansion) and slumping. Most of the soils formed in slope alluvium or residuum derived from shale or sandstone. Soils that formed in alluvium occur near the major waterways, and soils that formed in colluvium occur generally on slopes of more than 35 percent. The soils at the lower elevations generally have significant amounts of calcium carbonate, salts, and gypsum. The dominant soil orders in this MLRA are Aridisols and Entisols. Mollisols occur at the higher elevations, particularly in the northern part of the MLRA. Mollisols are fertile soils with high organic matter and a nutrient-enriched, thick dark surface. Aridisols and Entisols are described in the preceding text.

MLRA 47 – Wasatch and Uinta Mountains

The MLRA includes the Wasatch Mountains, which trend north and south, and the Uinta Mountains, which trend east and west. The steep sloping, precipitous Wasatch Mountains have narrow crests and deep valleys. Active faulting and erosion are a dominant force in controlling the geomorphology of the area. The Uinta Mountains have a broad, gently arching, elongate shape. Structurally, they consist of a broadly folded anticline that has an erosion resistant quartzite core. Some of the mountain areas that are above 7,500 feet and all of the areas above 10,000 feet have been subject to alpine or mountain glaciation. There are arêtes, horns, cirques, all types of moraines, and outwash features. In the southern part of the MLRA, there are rolling mountains and thrust-faulted plateaus that are broad, gently sloping surfaces with steep side slopes that have deep canyons cut into them. The Wasatch and Uinta Mountains have an elevation of 4,900 to about 13,500 feet amsl.

The soils in MLRA 47 primarily formed in slope alluvium, alluvium, colluvium, or residuum derived from sedimentary and igneous rocks. Alluvial fans at the base of the mountains are recharge zones for the basin fill aquifer. Soils derived from the Green River shale unit are fissile, calcareous, soft, and readily break down into clay- and silt-sized particles. The clay layers in sub-horizons impede root growth in locations. These soils also are often truncated due to sheet erosion. Soils derived from the North Horn Formation are subject to soil creep, slumping, and large landslide events. As the soils become saturated the probability of soil movement increases. For additional information on landslide prone areas refer to Section 3.2.5.1, Geology Regional Summary. The dominant soil orders in this MLRA are Aridisols, Entisols, Inceptisols, and Mollisols. Inceptisols are soils that exhibit minimal horizon development, but exhibit more soil development that Entisols. They are often shallow to bedrock or on steeply sloping lands. Aridisols, Entisols, and Mollisols are described in the preceding text.

MLRA 48A – Southern Rocky Mountains

The Southern Rocky Mountains consist primarily of two belts of strongly sloping to precipitous mountain ranges trending north to south. The ranges are dissected by many narrow stream valleys having steep gradients. In some areas the upper mountain slopes and broad crests are covered by snowfields and

glaciers. Several basins, or parks, are between the belts. Some high mesas and plateaus are included. High plateaus and steep-walled canyons are fairly common, especially in the west. Elevation typically ranges from 6,500 to 14,400 feet in this area.

The soils in MLRA 48A primarily formed in slope alluvium and colluvium on mountain slopes or residuum on mountain peaks derived from igneous, metamorphic, and sedimentary parent materials. Younger igneous parent materials, primarily basalt and andesitic lava flows, tuffs, breccias, and conglomerates, are located throughout this area. Representative formations in this area are the Silver Plume and Pikes Peak granites, San Juan Volcanics, and Mancos Shale. Alluvial fans at the base of the mountains are recharge zones for local basin and valley fill aquifers. The dominant soil orders in this MLRA are Mollisols, Alfisols, Inceptisols, and Entisols, which are described in the preceding text.

MLRA 29 – Southern Nevada Basin and Range

This MLRA is an area of broad, nearly level, aggraded desert basins and valleys between a series of mountain ranges trending north to south. The basins are bordered by sloping fans and terraces. The mountains are uplifted fault blocks with steep side slopes. The mountains are not well dissected due to a low amount of rainfall. Most of the valleys in this MLRA are closed basins containing sinks or playa lakes. Elevation ranges from 1,950 to 5,600 feet in the valleys and up to 9,400 feet in the mountains.

The soils in MLRA 29 primarily formed in alluvium on alluvial fans and fan pediments or residuum and colluvium on mountain slopes. Parent materials are derived from andesite, carbonate, and basalt. The soils generally are very shallow to very deep, well drained or somewhat excessively drained, and loamy-skeletal or sandy-skeletal. The valleys consist mostly of alluvial fill, but playa deposits occur at the lowest elevations in the closed basins. The alluvial valley fill consists of cobbles, gravel, and coarse sand near the mountains in the apex of the alluvial fans. Sands, silts, and clays are on the distal ends of the fans. The dominant soil orders in this MLRA are Aridisols and Entisols, which are described in the preceding text.

MLRA 28A – Great Salt Lake Area

This MLRA is an area of nearly level basins between widely separated mountain ranges trending north to south. The basins are bordered by long, gently sloping alluvial fans. The mountains are uplifted fault blocks with steep side slopes. They are not well dissected because of low rainfall. A large salt desert playa is south and west of Great Salt Lake. Most of the valleys in this MLRA are closed basins containing sinks or playa lakes. Elevation ranges from 3,950 to 6,560 feet amsl in the basins and from 6,560 to 11,150 feet amsl in the mountains.

The soils in MLRA 28A primarily formed in alluvium on alluvial fans, terraces, lake plains, and fan pediments or residuum and colluvium on mountain slopes. Dune lands formed in eolian materials. The soils in this area generally are well drained or somewhat excessively drained, loamy or loamy skeletal (lacking soil horizons and rocky), and very deep. Most of this area has alluvial valley fill and playa lakebed deposits at the surface. The dominant soil orders in this MLRA are Aridisols, Entisols, and Mollisols, which are described in the preceding text.

MLRA 35 – Colorado Plateau

In general, the surface consists of gently sloping to strongly sloping plains. Volcanic plugs that rise abruptly above the plains, steep scarps, or deeply incised canyons interrupt the surface of the plains. In most areas elevation is 4,250 to 4,950 feet amsl but the mountains range from 8,000 to 10,385 feet amsl.

The soils in MLRA 35 primarily formed in eolian deposits or alluvium on alluvial fans, cuestas, mesas, fan terraces, and fan pediments or residuum and colluvium on mesas, hills, ridges, and mountain slopes. Areas of shale, sandstone, limestone, dolomite, and volcanic rock outcrop are extensive. The dominant soil orders in this MLRA are Alfisols, Aridisols, Entisols, and Mollisols. Alfisols have a clay-enriched subsoil

and relatively high native fertility. Alfisols typically form under forests. Aridisols, Entisols, and Mollisols are described in the preceding text.

MLRA 30 – Mojave Desert

Broad basins, valleys, and old lakebeds make up most of the area, but widely spaced mountains trending north to south occur throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. Long alluvial fans coalesce with dry lakebeds between some of the ranges. Elevation ranges from 282 feet below sea level in Death Valley to 3,950 feet amsl in valleys and basins. Some mountain ranges have peaks that exceed 11,100 feet amsl.

The soils in MLRA 30 primarily formed in alluvial deposits on alluvial fans and valley floors. The soils are generally well drained to excessively drained, loamy-skeletal or sandy-skeletal, and shallow to very deep. They developed from metamorphic, igneous, carbonates, granitics, and nonmarine sedimentary and volcanic deposits. Recent alluvial fans and remnant alluvial fan terraces typically grade from boulder-strewn deposits and coarse desert pavement near the fan apex to finer grained sands, silts, and clays at the distal ends. Playas are at the lowest elevations in the closed basins. They commonly have eolian accumulations along their downwind fringes. Water from shallow subsurface flow and from surface flows that periodically fill the playa basins evaporates, leaving accumulations of evaporite minerals, including salts and borates. Saline and sodic soils are common.

The dominant soil orders in this MLRA are Aridisols and Entisols, which have been described in the preceding text.

3.3.4.2 Soil Characteristics

Soil characteristics such as susceptibility to erosion and the potential for revegetation are important to consider when planning for construction activities and stabilization of disturbed areas. These hazards or limitations for use are a function of many physical and chemical characteristics of each soil, in combination with the climate and vegetation. Sensitive soils including prime farmland, hydric, highly erodible, limited revegetation potential, droughty, and other important soil characteristics are described in further detail below.

Water erosion is the detachment and movement of soil by water. Natural erosion rates depend on inherent soil properties, slope, soil cover, and climate. Erosion prone soils were characterized as having a soil erodibility factor (Kw) greater than 0.28 and slope greater than15 percent. Wind erosion is the physical wearing of the earth's surface by wind. Wind erosion removes and redistributes soil. Small blowout areas may be associated with adjacent areas of deposition at the base of plants or behind obstacles, such as rocks, shrubs, fence rows, and roadbanks (Soil Quality Institute 2001). Wind erodible soils were characterized as having a wind erodibility group value of 1 or 2.

Soils with LRP have chemical characteristics such as high salts, sodium, or pH that may limit plant growth. Saline soils affect plant uptake of water and sodic soils often have drainage limitations. In addition, the success of stabilization and restoration efforts in these areas may be limited unless additional treatments and practices are employed to offset the adverse physical and chemical characteristics of the soils.

Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. These soils have the capability to be prime farmland, but may have not yet been developed for irrigated agriculture uses.

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils are commonly

associated with floodplains, lake plains, basin plains, and with riparian areas, wetlands, springs, and seeps. Due to the scale of mapping, small areas of hydric soils may not be captured by this dataset.

In areas with a shallow depth to lithic bedrock (relative to the structure foundation excavation depth), excavation may result in rock fragments remaining on the surface at levels that would limit the success of restoration efforts. Where the alternative routes cross soils with lithic bedrock, blasting or specialized drilling equipment may be required for installing structure foundations.

Soil compaction occurs when soil particles are pressed together and the pore spaces between them are reduced and bulk density is increased. This results in a decrease in infiltration and an increase in runoff and erosion. Moist, fine textured (clayey) soils are most susceptible to compaction. Soils with greater than 28 percent clay were interpreted as compaction prone.

Soil limitations within the analysis area related to shallow excavations include cutback caving, flooding, large stones, slope, and a cemented pan within the soil profile. These limitations are important to consider during construction.

Other sensitive soils within the analysis area include expansive soils, collapsible soils, and soils with a high susceptibility to subsidence, dissolution, or piping.

Corrosion potential pertains to soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. For uncoated steel, the risk of corrosion is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract. For concrete, the risk of corrosion is based on soil texture, acidity, and amount of sulfates in the saturation extract (NRCS 2011).

Biological soil crusts are considered an important component in dry arid ecosystems. They provide soil stability, prevent erosion, fix nitrogen, increase infiltration rates, and may reduce noxious weed migration. Biological soil crusts occur throughout the analysis area. The southern portion of the analysis area (specifically the northeast portion of the Mojave Desert) has a relatively high cover of biological soil crusts. No data exist on soil crust coverage of the entire analysis area; however, research shows that biological soil crusts do best where sedimentary parent materials are found (Belnap et al. 2003). In arid environments, biological soil crusts are essential for soil stability due to minimal vegetative growth and soil cover.

3.3.5 Regional Summary

Table 3.3-1 summarizes MLRAs along with important soil limitations within each region. Soils with severe wind and water erosion potential and soils with limited revegetation potential and farmlands of statewide importance along with the MLRAs within each region are depicted in **Figures 3.3-1** through **3.3-16**.

3.3.6 Impacts to Soils

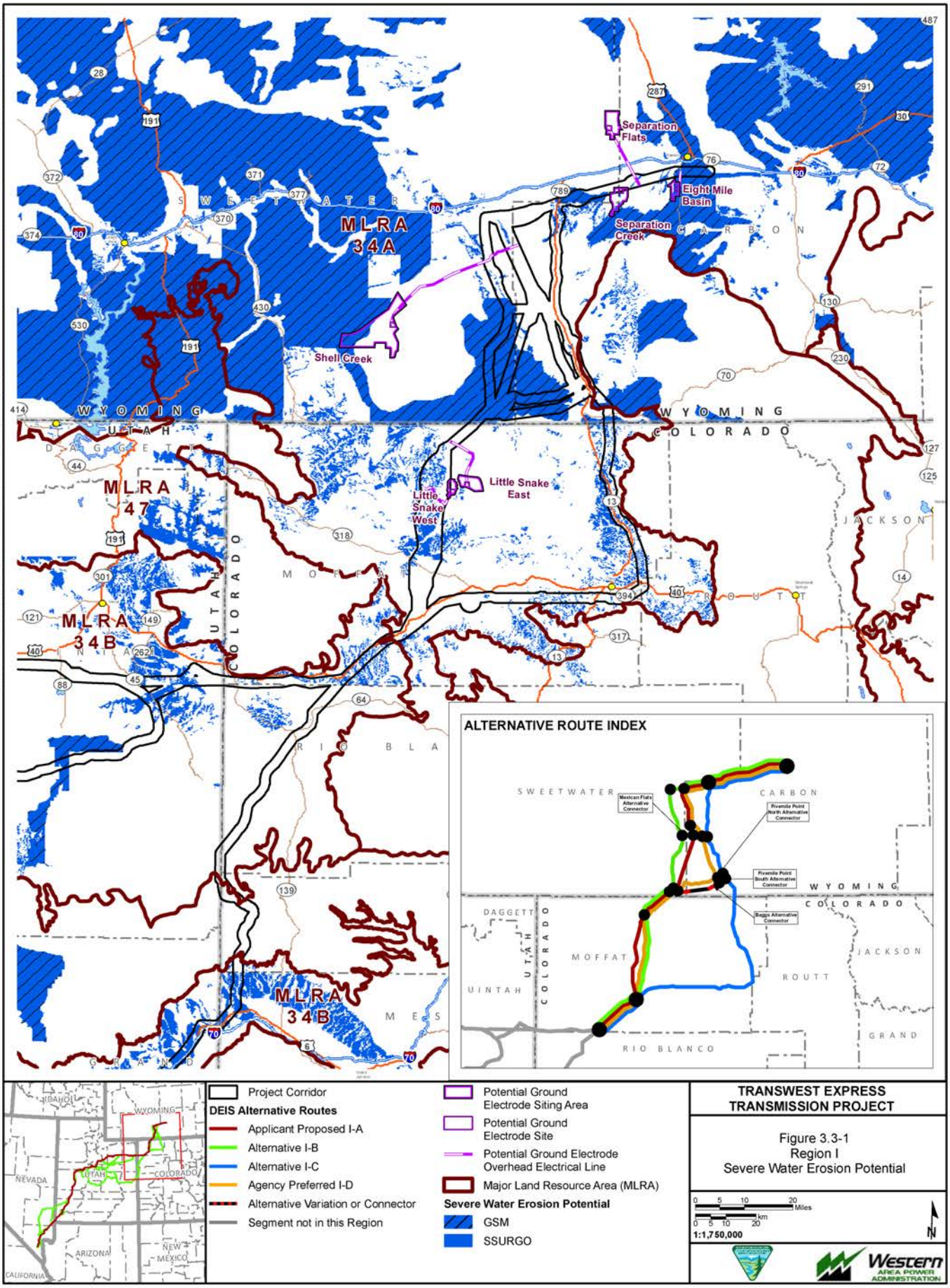
The impact analysis area for soil resources encompasses the applicant-proposed route and all alternatives, and includes a 250-foot-wide transmission line ROW centered on each reference line to analyze all impacts except for the access roads and other ancillary facilities and work areas. For the analysis of the access roads, ancillary facilities, and work areas, a generally 2-mile transmission line corridor along the proposed and alternative routes would be used. A larger analysis area for access roads was required because their locations have not been defined at this time.

Table 3.3-1 Soil Limitations Within the Regions and MLRAs (Percentage)

Region	MLRA Number	Wind Erosion	Water Erosion	Compaction	Limited Revegetation Potential	Hydric	Prime Farmland	Shallow Bedrock	Risk of Corrosion – Concrete	Risk of Corrosion – Steel	Shallow Excavations	Small Commercial Buildings
I	34A	5.4	5.7	13.9	19.0	0.1	3.0	6.4	5.3	28.8	12.0	15.9
	34B	<0.1	1.4	2.7	2.0	0	0.9	0.3	2.3	3.2	2.2	3.1
	48A	<0.1	<0.1	0.1	<0.1	0	0	0	<0.1	0.1	0	0
II	47	<0.1	1.3	6.3	3.1	<0.1	0.4	5.0	0.2	9.0	4.9	5.4
	28A	3.0	0.1	3.2	6.1	0.8	2.0	1.9	4.9	11	7.5	7.7
	34B	1.1	4.6	14.7	16.5	0.1	2.8	6.9	9.2	27.0	17.9	21.8
	48A	0	0.1	1.4	1.6	0	0.9	2.1	0.2	3.3	1.7	1.9
III	29	<0.1	0.3	4.6	1.8	0	1.5	4.1	0.2	6.7	7.4	6.9
	30	1.2	0.9	1.8	3.9	0.1	0	12.2	2.1	19.2	17.5	16.9
	47	0	0	1.1	0.3	0	<0.1	1.3	<0.1	0.6	0.1	0.1
	28A	1.7	0	16.8	32.4	0.8	2.7	4.0	13.8	41.7	15.8	14.4
IV	30	8.6	0.8	0	26.2	0	0	21.1	17.9	65.1	75.1	73.3

Note: GSM data did not have interpretations for shallow excavations, small commercial buildings, or prime farmland. Percentages for these interpretations exclude areas with only GSM data.

Source: USDA 2006; NRCS 2011.



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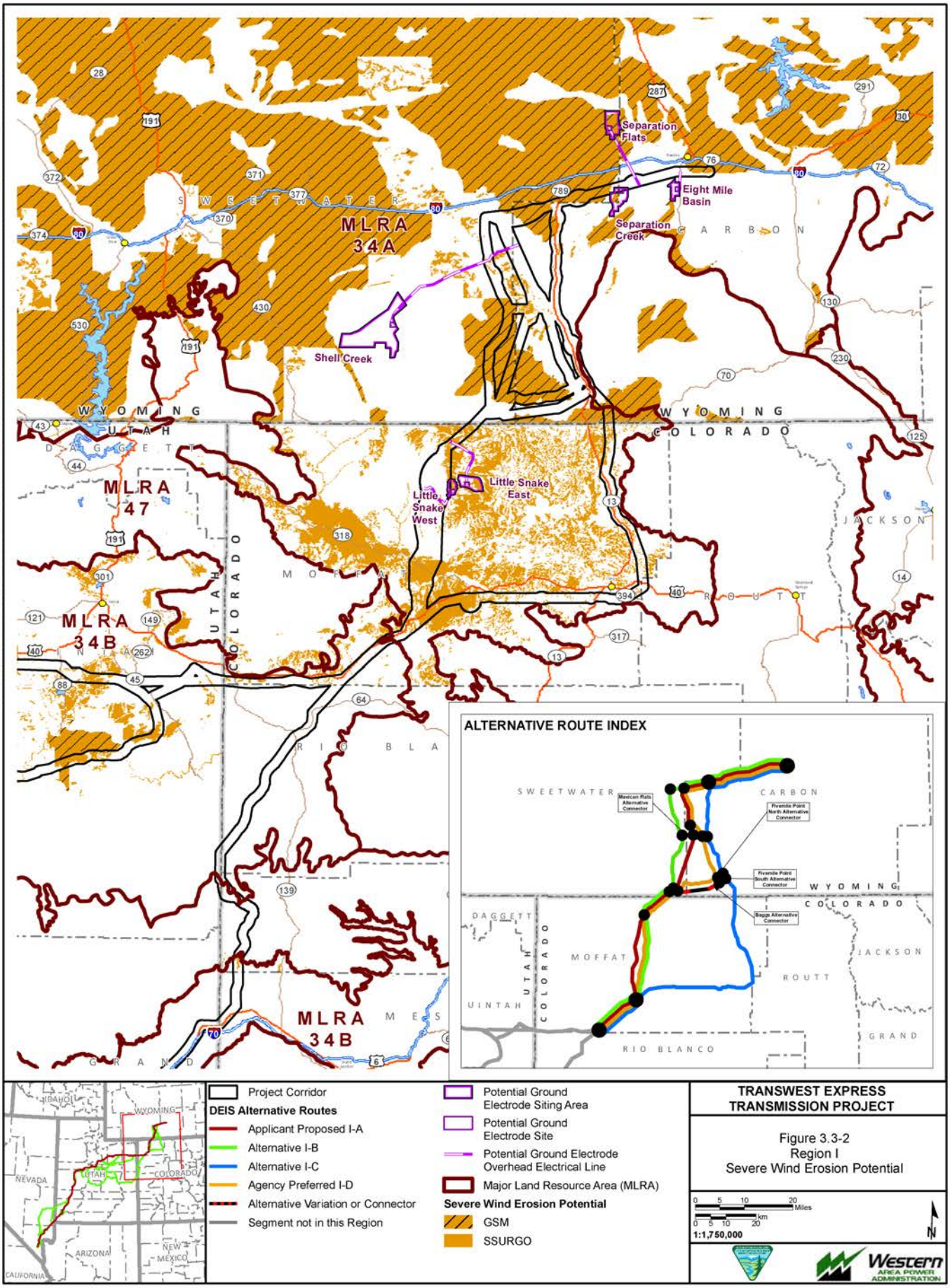
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Eight Mile Basin
Separation Creek
Shell Creek
Little Snake West
Little Snake East
MLRA 34A
MLRA 47
MLRA 34B
MLRA 34B
SWEETWATER
CARBON
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
JACKSON
ROUTT
RIO BLANCO
GRAND
MESA
UINTAH
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Riverside Point North Alternative Connector
Riverside Point South Alternative Connector
Baggs Alternative Connector
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Major Land Resource Area (MLRA)
Severe Wind Erosion Potential
GSM
SSURGO
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.3-2
Region I
Severe Wind Erosion Potential
Miles
km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
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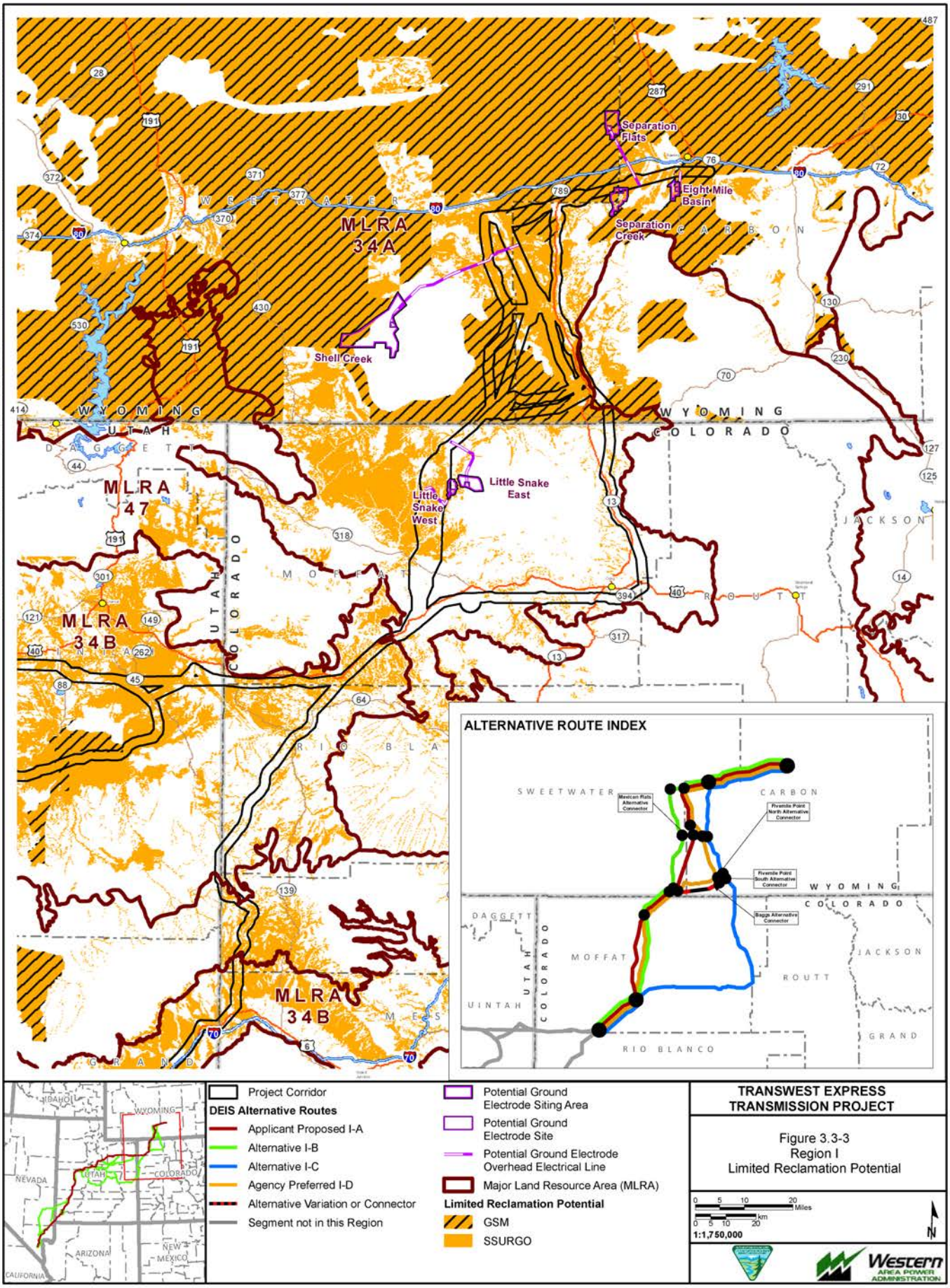
Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake East
Little Snake West
MLRA 34A
MLRA 47
MLRA 34B
MLRA 34B
SWEETWATER
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DEIS Alternative Routes
Applicant Proposed I-A
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Alternative I-C
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Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Major Land Resource Area (MLRA)
Limited Reclamation Potential
GSM
SSURGO
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.3-3
Region I
Limited Reclamation Potential
Miles
km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
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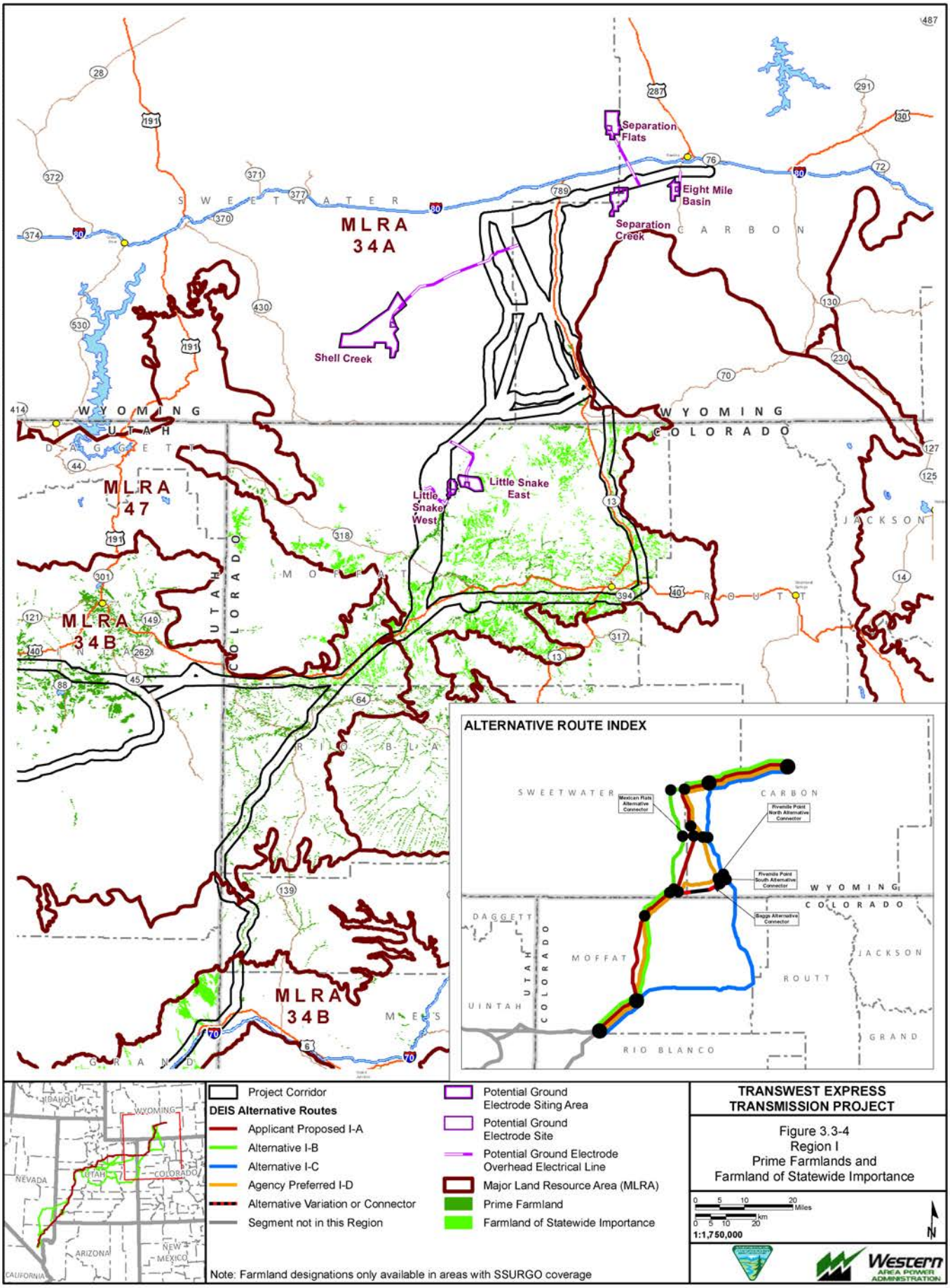

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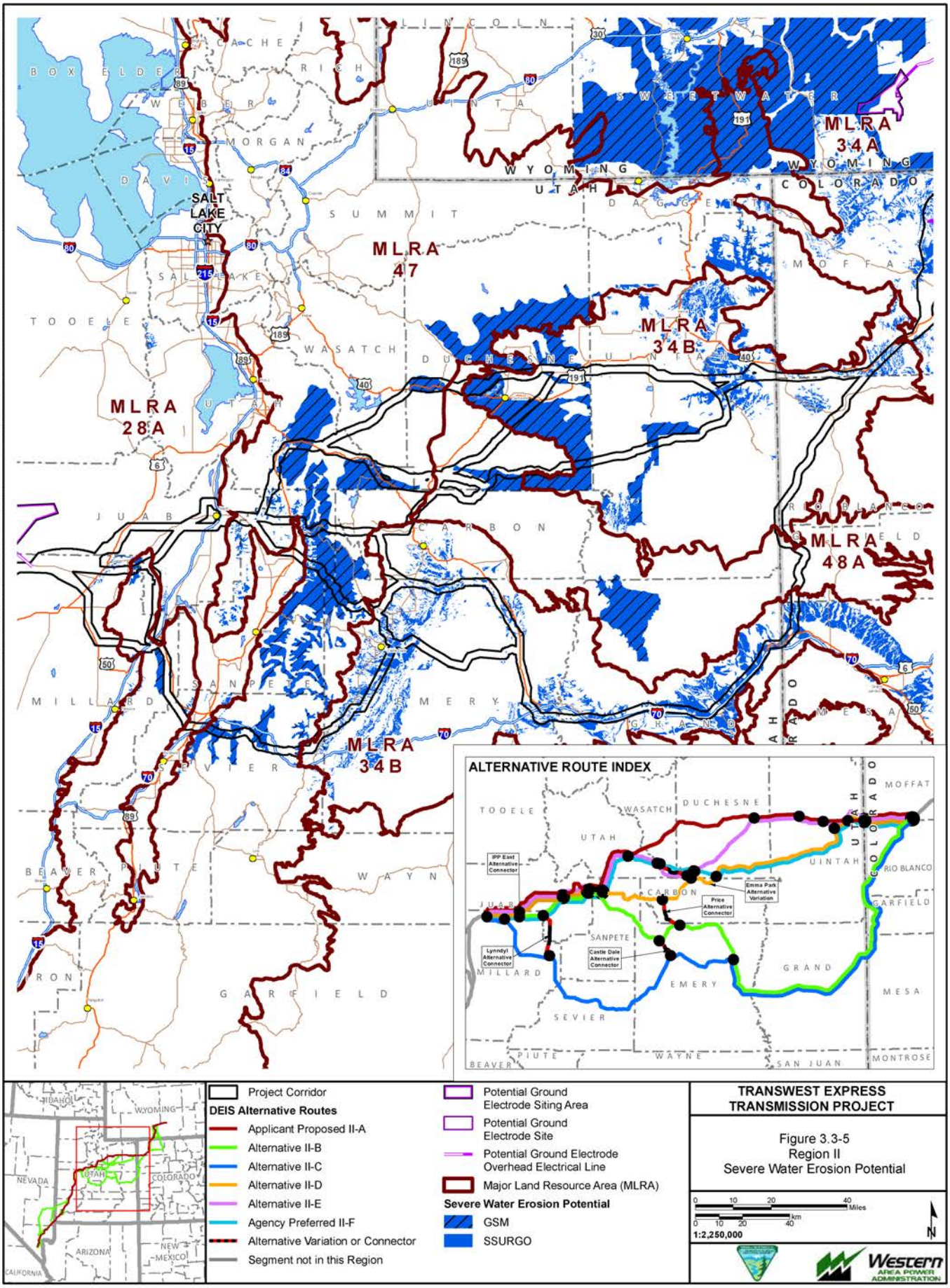

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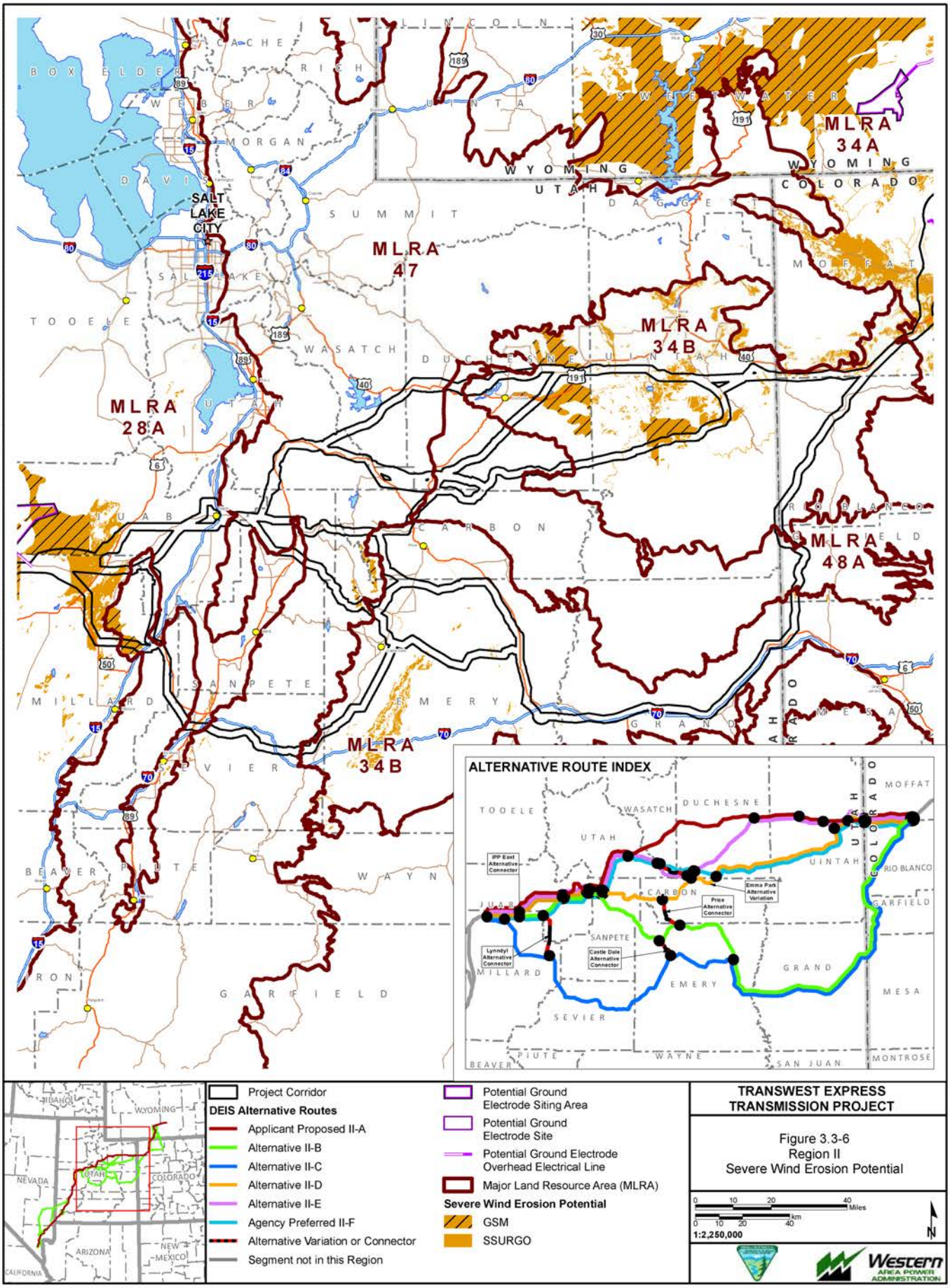

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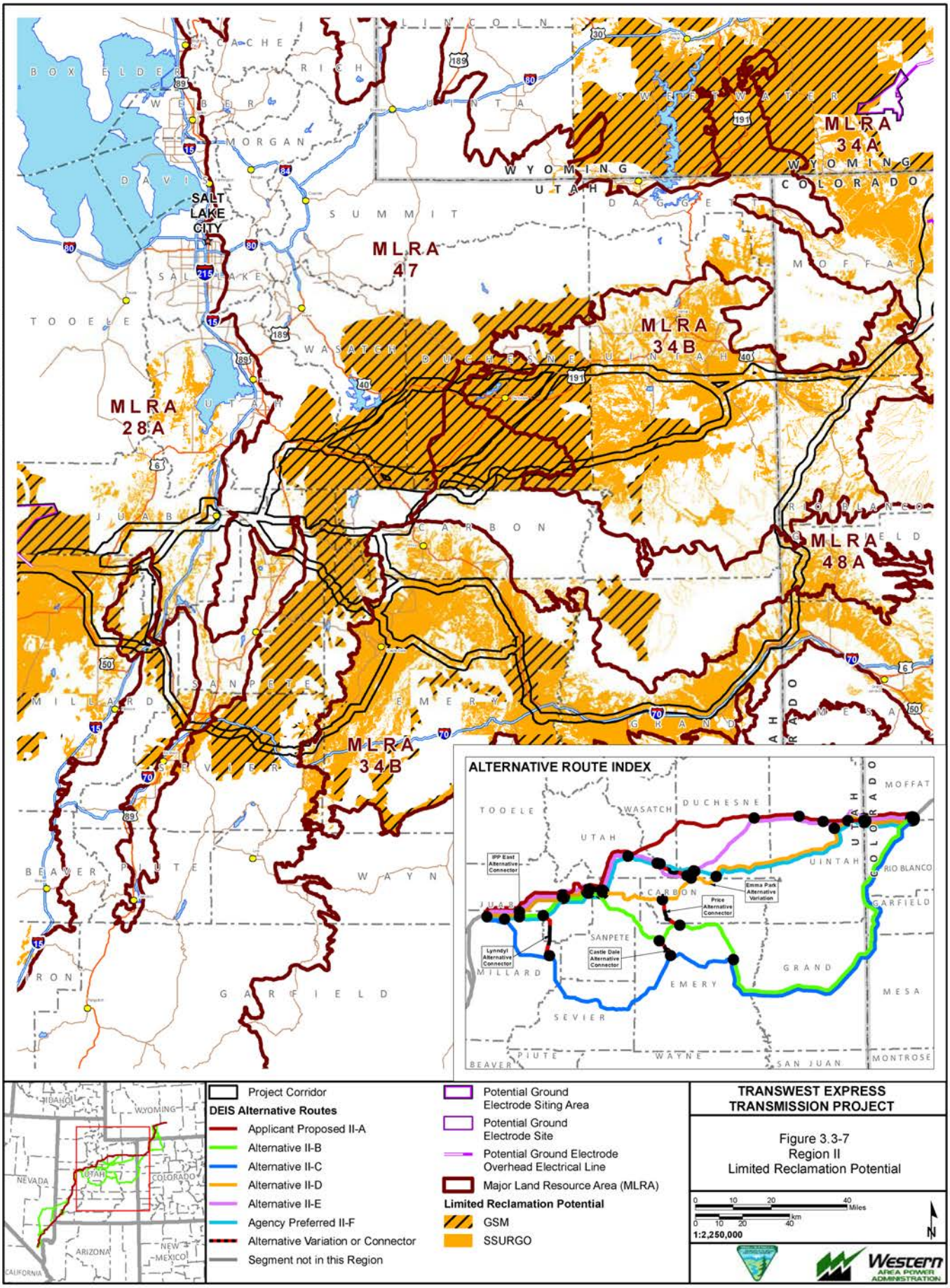

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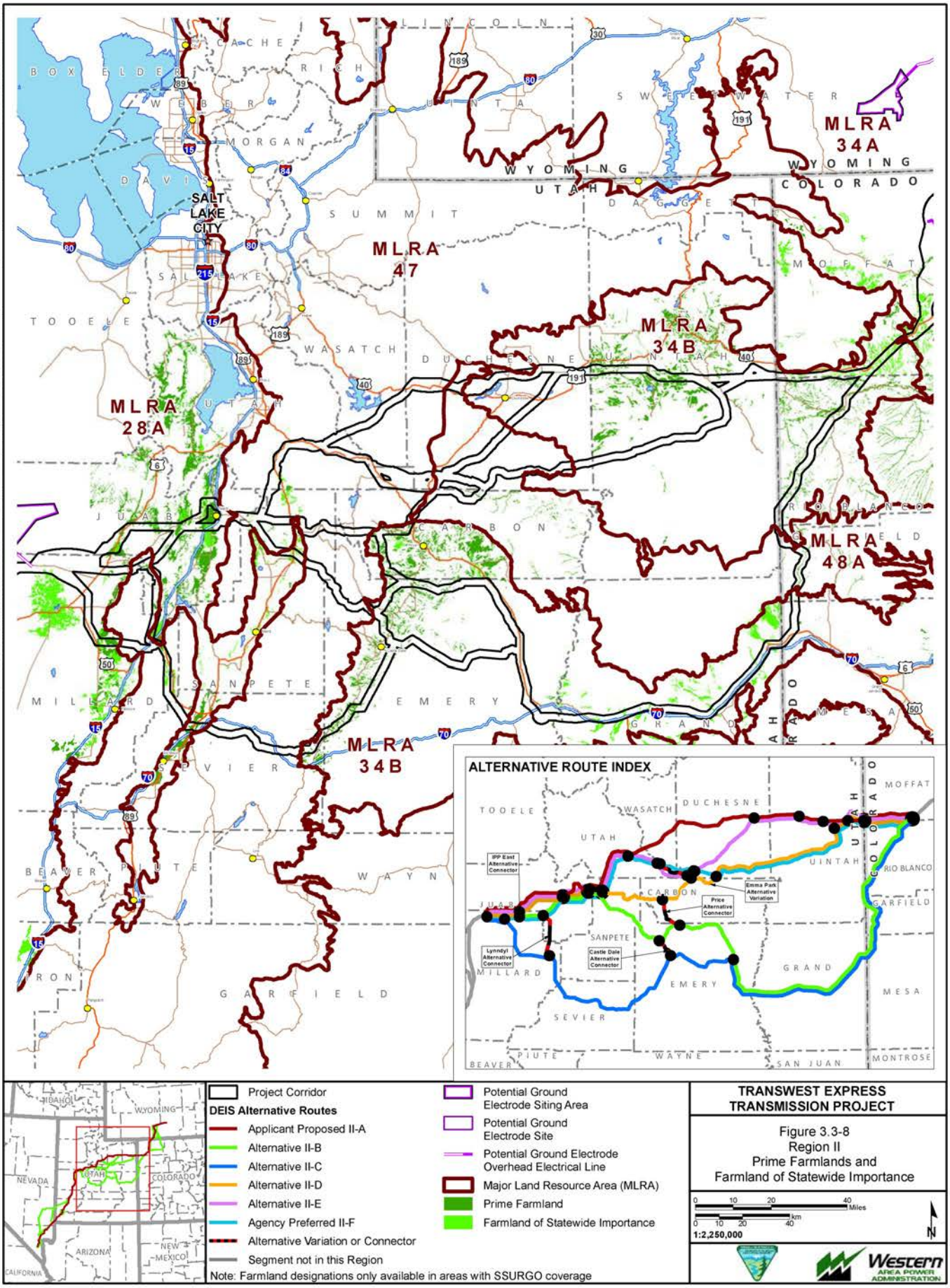

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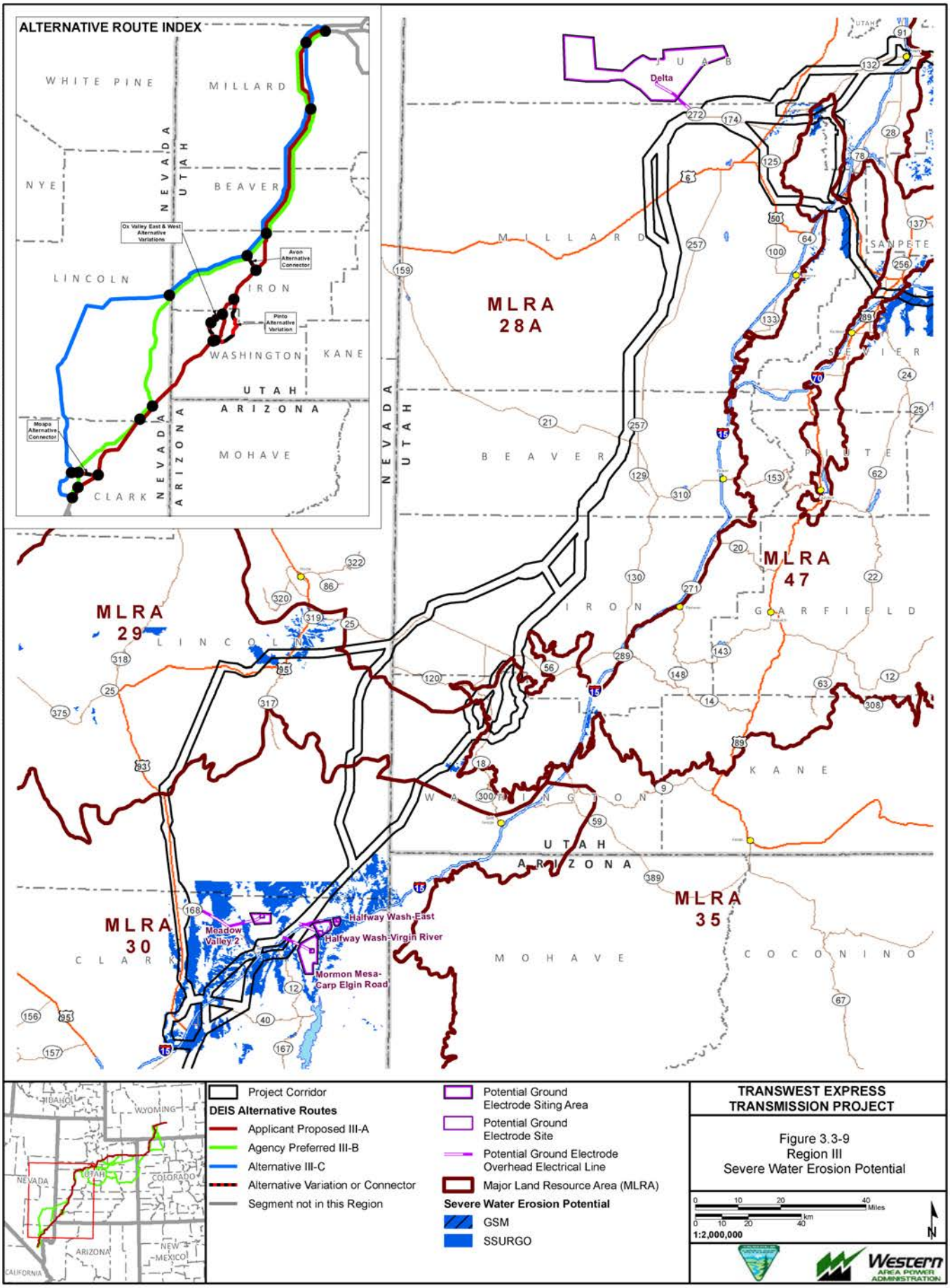
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Pinto Alternative Variation
Moapa Alternative Connector
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Segment not in this Region
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Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Major Land Resource Area (MLRA)
Severe Water Erosion Potential
GSM
SSURGO
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.3-9
Region III
Severe Water Erosion Potential
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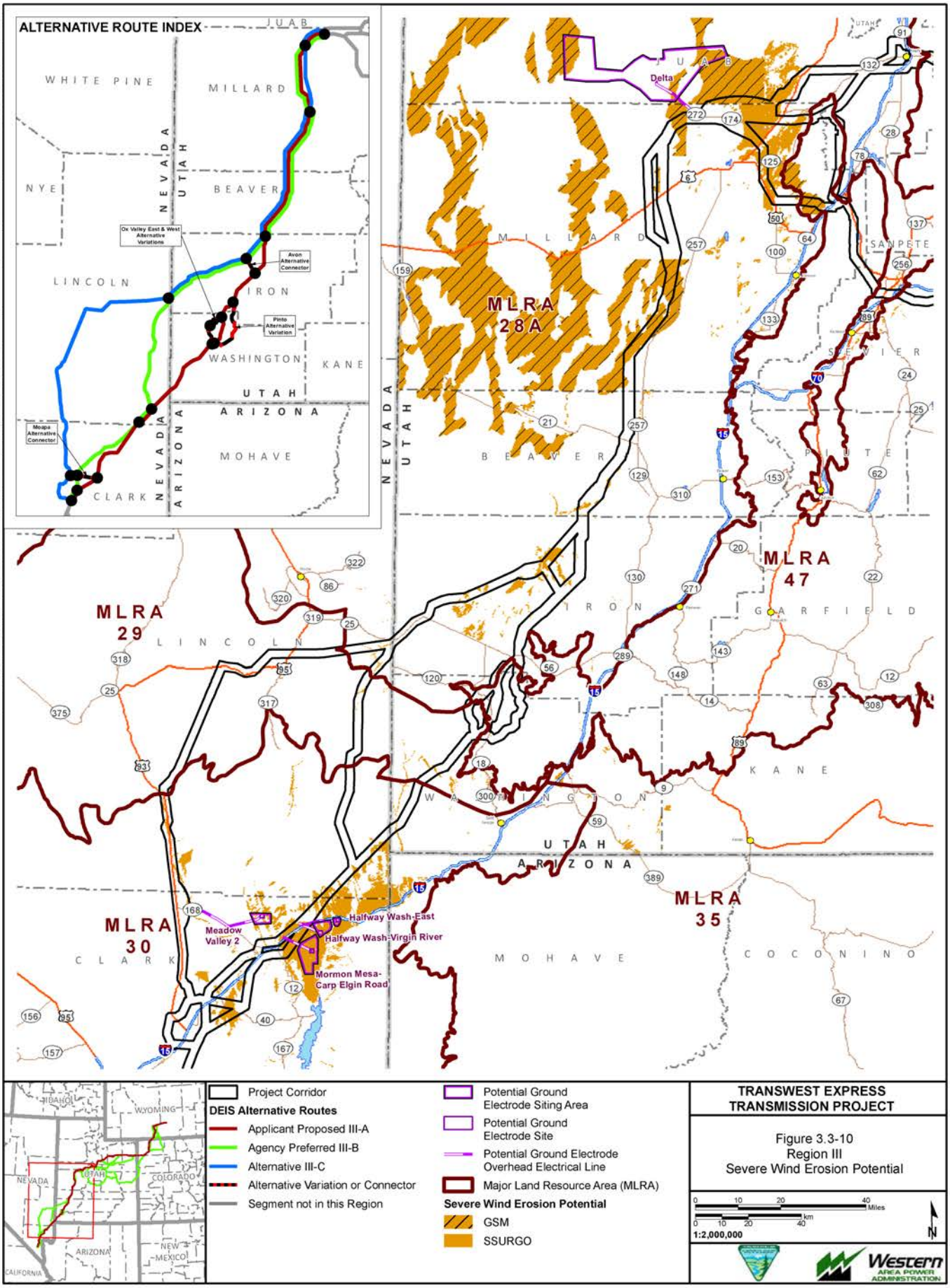
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Segment not in this Region
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Severe Wind Erosion Potential
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CALIFORNIA
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.3-10
Region III
Severe Wind Erosion Potential
Miles
km
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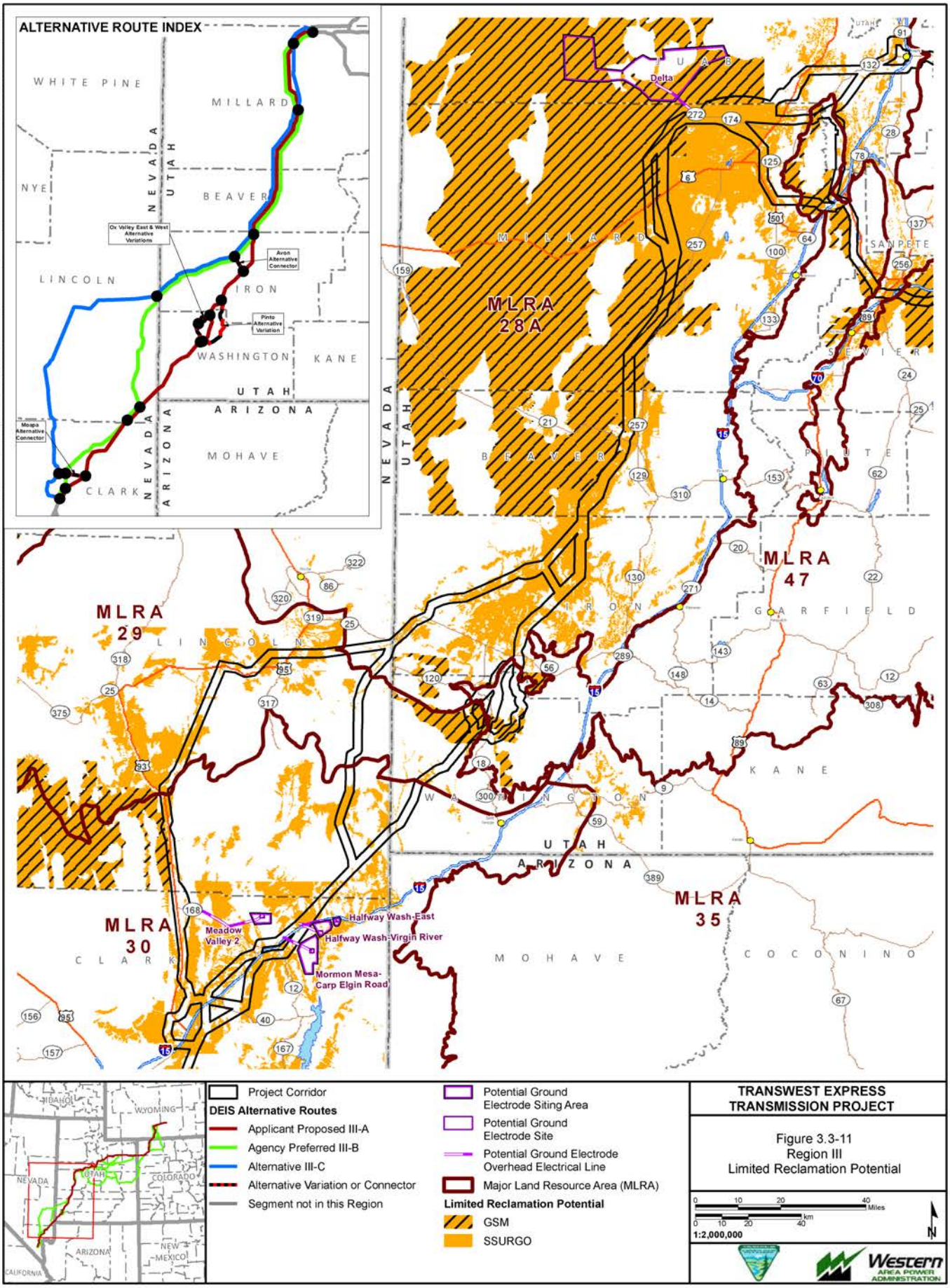
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Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Major Land Resource Area (MLRA)
Limited Reclamation Potential
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Figure 3.3-11
Region III
Limited Reclamation Potential
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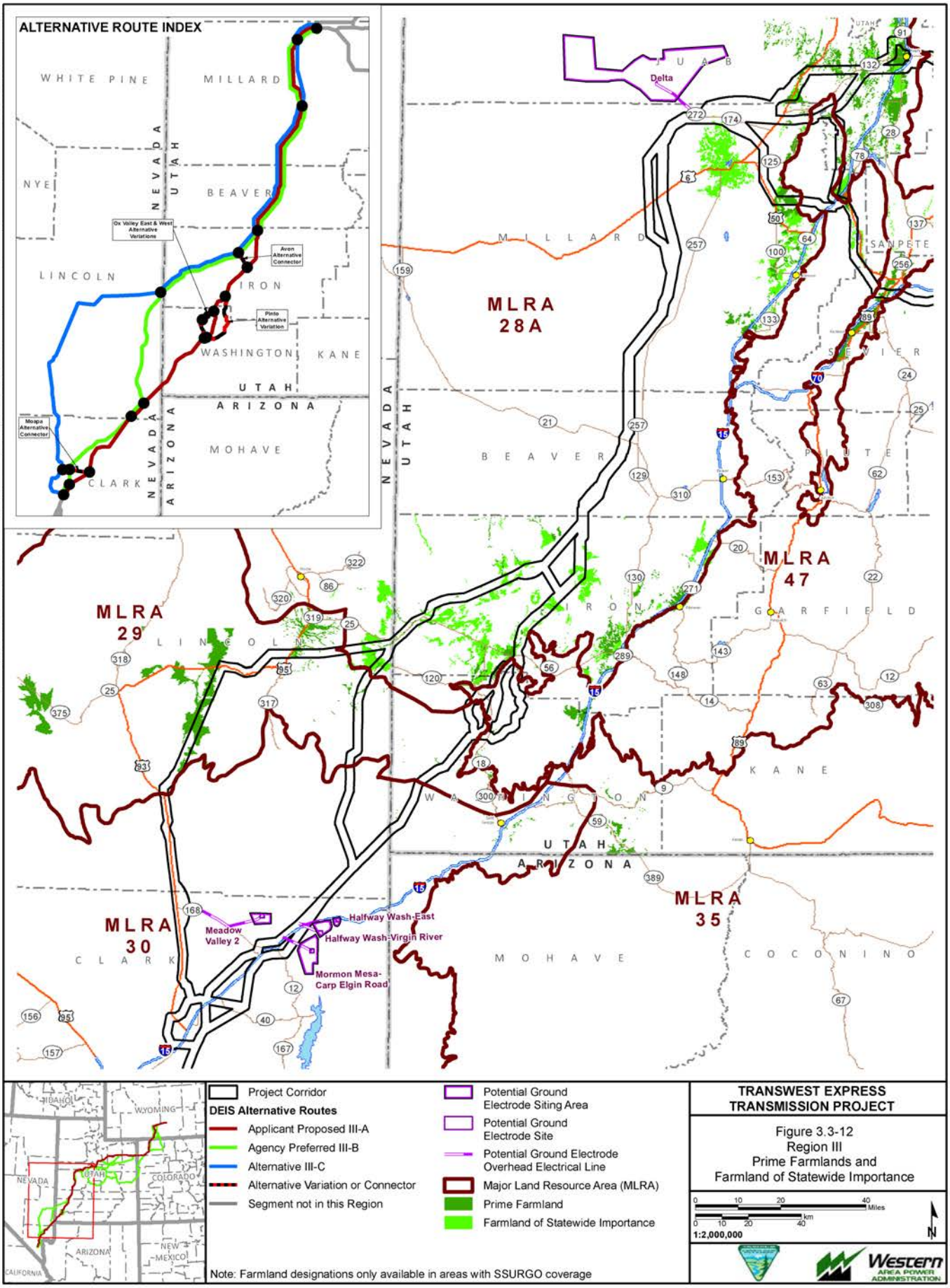
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Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Major Land Resource Area (MLRA)
Prime Farmland
Farmland of Statewide Importance
Note: Farmland designations only available in areas with SSURGO coverage
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.3-12
Region III
Prime Farmlands and
Farmland of Statewide Importance
1:2,000,000
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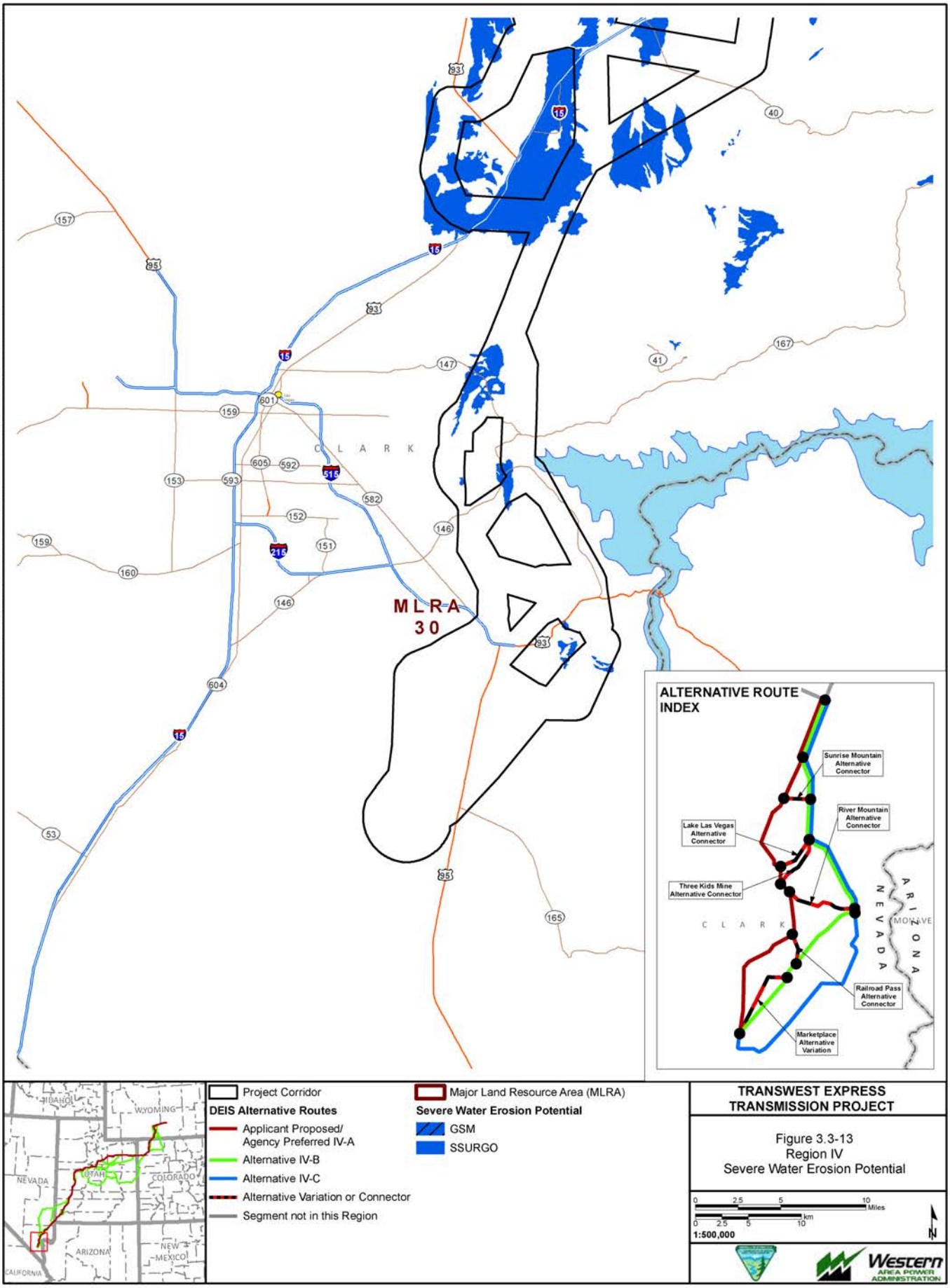

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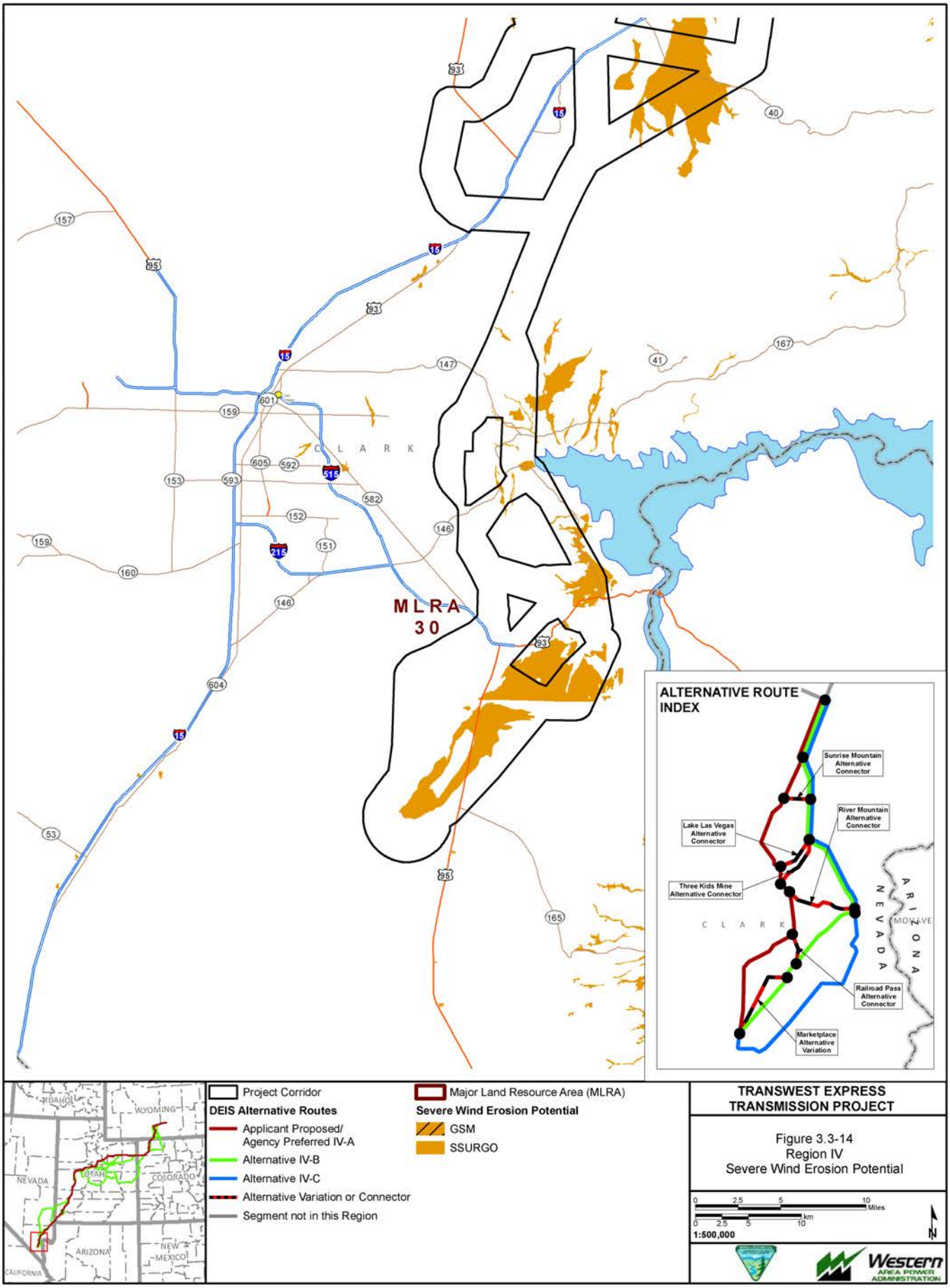

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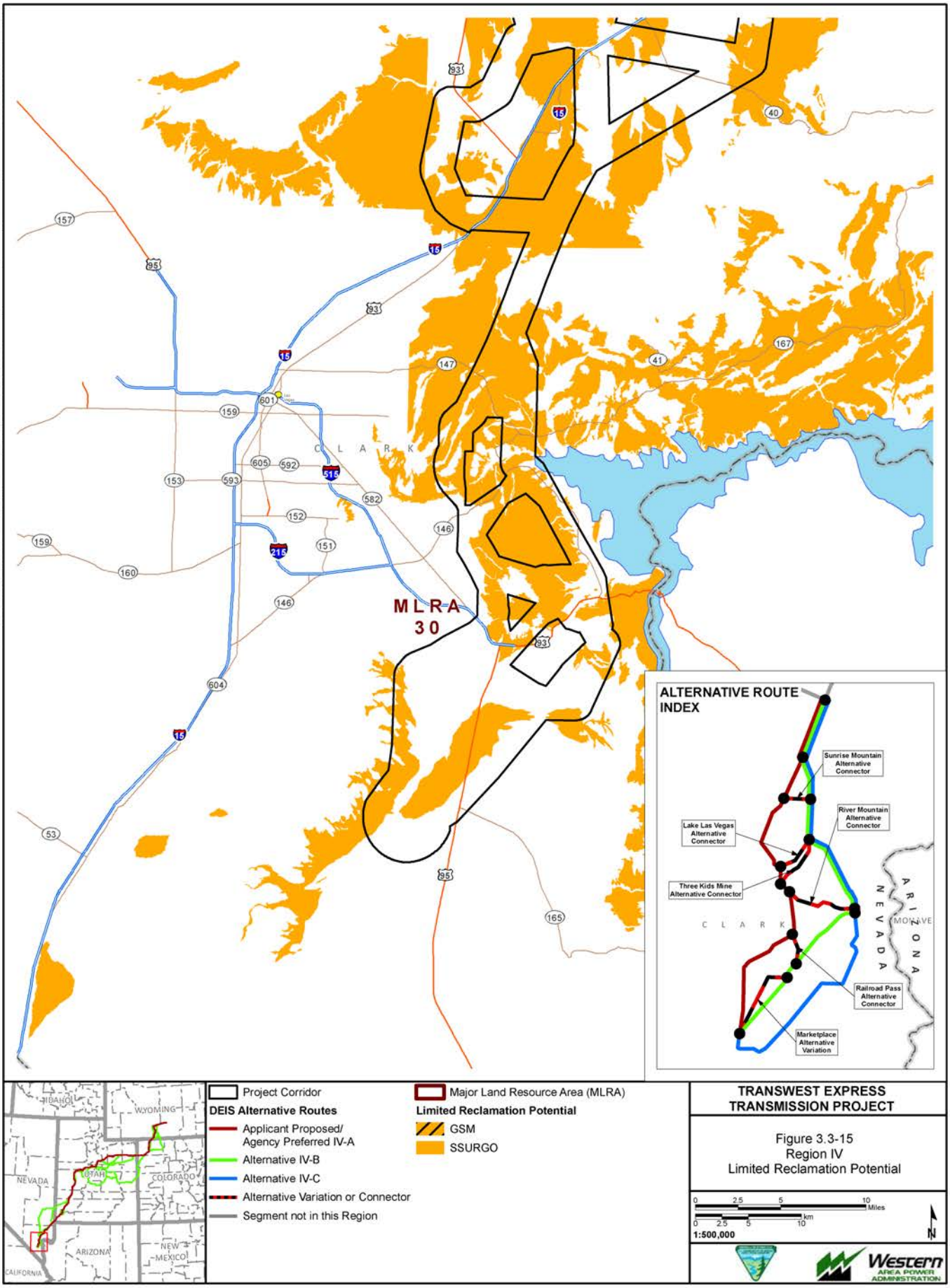

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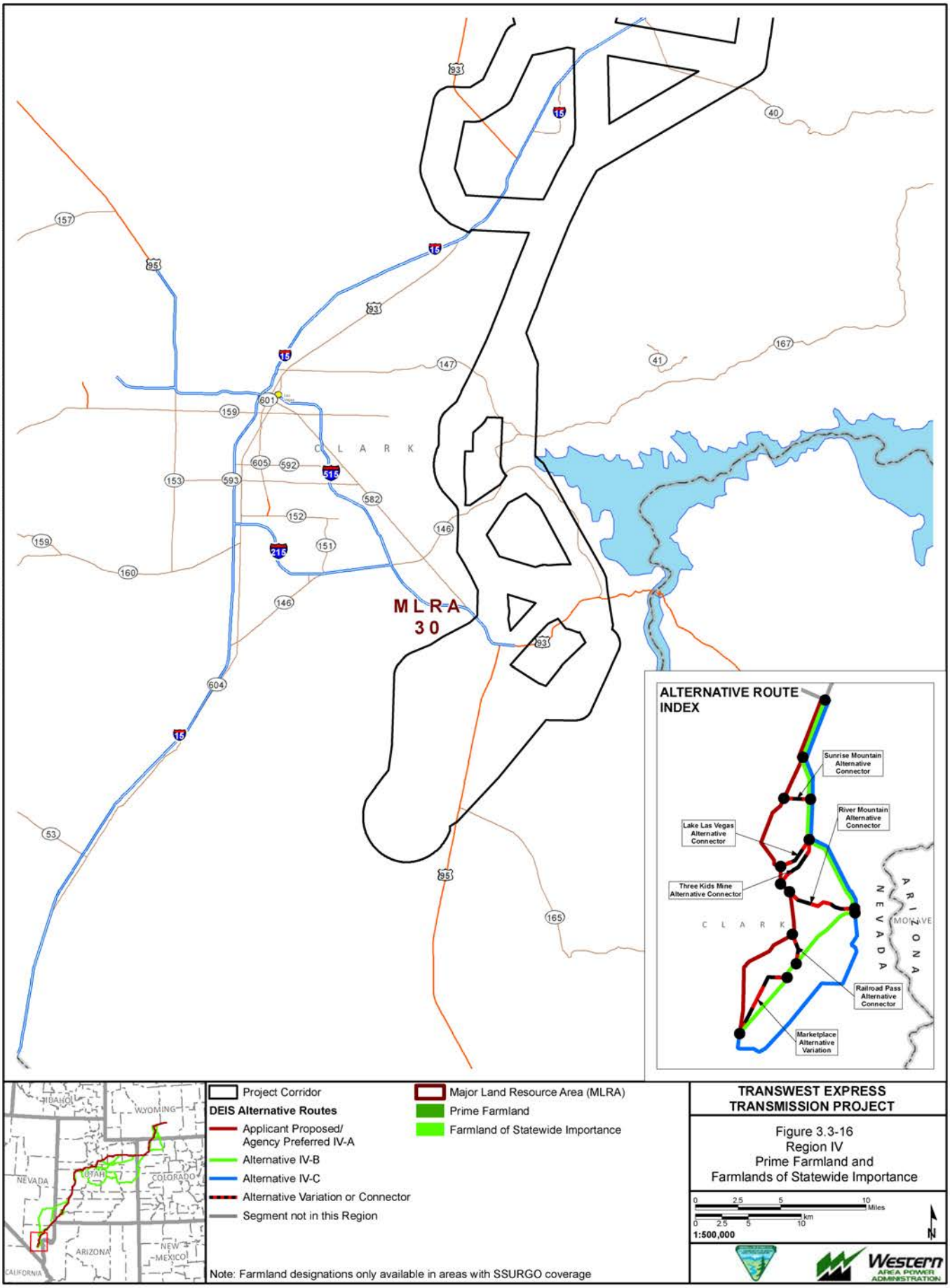

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The methodology for evaluating impacts on soil resources involved analyzing soil survey data in relation to the proposed surface disturbance areas. To determine acres of soils disturbed by the proposed project, the known locations of proposed surface disturbances were overlain on the NRCS SSURGO order 3 soil survey layer (or GSM data where SSURGO data are unavailable) to determine the acreage of soils lost or disturbed. Temporary impacts to soils are those that are anticipated to be short-term in nature and following construction would be reclaimed and revegetated. Long-term impacts to soils would include areas where structures, surface facilities, or long-term access roads would be located for the duration of the project.

The analysis of the impacts to soil resources is based on the assumption that the TWE Project design features, WWEC BMPs, and agency use stipulations would be implemented as part of the project. These design features, agency use stipulations, and BMPs listed in **Appendix C**, address the compensation for damage to agricultural land and fences, erosion control and BMPs, recontouring, and other practices that would minimize soil resources impacts when implemented. To minimize construction related impacts to soil resources, reclamation would be conducted as soon as practical following surface disturbance. Additionally, TWE would be required to abide by the goals, objectives, and management actions outlined in each BLM RMP, and the standards and guidelines in each USFS LRMP. The respective resource management plans for each land management agency crossed by the proposed project are listed in Chapter 1.0, **Table 1-3** and **Table 1-4**.

Third-party Environmental Compliance Monitors (ECMs) would be on-site during construction. These ECMs would be responsible for making sure TWE is in compliance with all applicable recommended mitigation measures, agency use stipulations and requirements, BMPs, and design features.

Issues related to soil resources as identified during the scoping process include the following:

- Disturbance and potential loss of biological soil crusts;
- Soil disturbance during construction activities resulting in accelerated soil erosion, exposed soils, the potential for mass failure, and reduced soil productivity; and,
- Potential for successful reclamation of soils with physical or chemical reclamation constraints.

Relevant management considerations are shown in **Table 3.3-2**.

Table 3.3-2 Relevant Analysis Considerations for Soils

Resource Topic	Analysis Considerations and Relevant Assumptions
Soil Quality and Productivity	Any surface disturbance has the potential to degrade soil quality and productivity because it damages the biological soil crust and exposes the bare soil to the erosive forces of wind and water until vegetation or other ground cover is established.
Soil Erosion	Bare soil (without vegetation or other surface cover) with a surface layer that has been altered from its natural condition is more susceptible to accelerated wind and water erosion than undisturbed soil. Erosion from disturbed areas would be minimal once vegetation is reestablished. Successful establishment of vegetation generally takes a minimum of 3 to 5 years, depending on soil and precipitation, and requires monitoring during this time.
Soil Stability	Surface disturbance from construction would modify soils by disrupting soil stability, changing vegetative cover that can reduce nutrient recycling, damaging biological crusts, decreasing productivity, and increasing compaction.
Sensitive Soils	Sensitive soils, including those that are highly erodible, have a high pH, high salinity or sodicity, have a high clay content, occur on steep slopes of 35% or more, or have a limited revegetation potential, would incur greater adverse impacts from surface-disturbing activities than non-sensitive soils.
Soil Standards	The Standards for Public Land Health (BLM 1997) provide minimum standards for vegetation health, vigor, soil cover, and erosion rates that apply to all BLM administered activities.

Table 3.3-2 Relevant Analysis Considerations for Soils

Resource Topic	Analysis Considerations and Relevant Assumptions
Highly Erodible Soils	When surface disturbance occurs on highly erodible soils, the potential for accelerated erosion is greater than on less erodible soils. The risk of BMP failure is greater on highly erodible soils. To be effective on highly erodible soils, more extensive BMPs and more aggressive maintenance techniques than those commonly used are often required.
Soil Compaction	Operating motorized vehicles on moist soils, especially heavy equipment, is likely to cause compaction of the surface layer, which may increase runoff, decrease infiltration and aeration, and reduce soil productivity by making it more difficult for plant roots to establish or obtain soil moisture and nutrients.
Soil Data	Impact analysis with order 3 SSURGO data is more accurate and detailed than analysis with U.S. GSM data. GSM data has not been field verified and does not have interpretive data associated with prime farmlands, hydric soils, shallow excavations limitations, or small commercial buildings limitations and acreage associated with these would be zero.

3.3.6.1 Impacts from Terminal Construction, Operation, and Decommissioning

The northern and southern terminals would be constructed regardless of alternative route or design option. **Table 3.3-3** summarizes the soil characteristics of soils within the disturbance footprint of the Northern and Southern terminals and Design Options 2 and 3.

Northern Terminal

Construction of the Northern Terminal would disturb approximately 504 acres of soils. A permanent loss of soil resources would be expected on approximately 234 acres for the permanent Project facilities. Approximately 270 acres would be temporarily disturbed for construction work areas. **Table 3.3-3** summarizes the soil characteristics of soils within the disturbance footprint of the Northern Terminal.

The northern terminal is proposed to be constructed on relatively undisturbed uplands. Grading may be required to create a level working surface. Where the topography is relatively flat and grading occurs, it would be limited to the upper subsurface soil horizons. Where cut and fill slopes occur, the soil profiles would be mixed with a corresponding loss of soil structure. Mitigation measure **S-1** is recommended to prevent topsoil mixing with subsoil and to promote successful revegetation during decommissioning. If soils are saturated or frozen when grading or soil salvage activities occur, it could result in improper topsoil segregation due to difficulty with soil handling. Reapplication on or of frozen soils could result in voids or collapses as the soil defrosts. Mitigation measure **S-2** is recommended to mitigate impacts associated with working with frozen or saturated soils. BMPs that would reduce impacts to soil resources during construction include: SOIL-1 (salvage, safeguard, and reapply topsoil from all excavations and construction activities) and AIR-1 (cover construction materials and stockpiled soils if these are sources of fugitive dust). In general most topsoil stockpiles would be temporary and short-term. However at project facilities, a decrease in soil productivity would occur in association with soil salvage and stockpiling activities as microbial action is curtailed, at least to some degree, in the constructed long-term stockpiles.

***S-1**: Where permanent facilities or structures would be located, the entire topsoil horizon would be salvaged for use in reclamation, prior to surface disturbance. Topsoil would be spread evenly around the permanent structure (not left in piles) and revegetated for future use.*

Effectiveness: Salvaging all topsoil from locations where permanent facilities or structures would be located, would increase the potential for successful reclamation during decommissioning.

***S-2**: Construction, excavation, or re-spreading with frozen or saturated soils would be prohibited.*

Effectiveness: BMPs prohibit topsoil stripping when soils are saturated or frozen. Through the implementation of measure **S-2**, impacts to soils due to uneven settling, compacted surfaces, and physical

crusts reducing water infiltration would be avoided. Through the implementation of mitigation measure **S-3** and BMPs, impacts to soils from grading activities would be effectively reduced.

Soil compaction would result from the movement of construction vehicles on roads and temporary work areas. Soil compaction would impact the upper profile subsoils immediately beneath the road and construction work surface, but also would impact subsurface soils at a greater depth if fine textured soils are present. Soil compaction would result in a corresponding loss of infiltration, permeability, and soil aeration. An increase in runoff and erosion would be expected on bare, compacted soils at construction work areas. BMP WAT-9 would require control of erosion using techniques such as silt fences, water bars, hay bales, or erosion berms; this would reduce soil erosion off site. BMP SOIL-5 would require compacted soils to be chiseled or ripped, which would help to reduce the impacts associated with compaction. Temporary work areas would be reclaimed and revegetated following construction. These impacts, along with a loss in soil productivity, would occur for the duration of project construction and until successful reclamation is achieved. Additional mitigation measure **S-3** is recommended to further mitigate compaction impacts during reclamation.

S-3*: During reclamation, compacted areas (typically any area that receives repeated traffic or 3 or more passes by heavy equipment) will be decompacted, to the depth of compaction, by subsoiling, paraplowing, or parabolic ripping on the contour to the depth of compaction. This would help prepare the seed bed, encourage infiltration and help to prevent accelerated runoff and erosion. Scarification would only be used on shallow soils. Compaction depth would be determined on a case by case basis, by a qualified environmental inspector or soil scientist.*

Effectiveness: Decompacting to the depth of compaction reduces the potential for buildup of alkalinity, salts, or sodium over a subsurface compacted layer. Additionally, it prevents water from infiltrating and flowing laterally once it hits a deep compacted layer, carrying surface soils away, or causing instability of saturated soils on slopes. Site specific permanent impacts to soil quality and productivity would be expected from terminal construction where permanent facilities are located. Through the implementation of the design features, BMPs, agency use stipulations, additional mitigation and considering the upland locations of the terminals, little to no impacts related to erosion and sedimentation are expected.

Southern Terminal

Construction of the Southern Terminal would disturb approximately 412 acres of soils. A permanent loss of soil resources would be expected on approximately 203 acres for the permanent Project facilities. Approximately 209 acres of soils would be temporarily disturbed for construction work areas. Similar impacts would be expected as described for the Northern Terminal. There is a proposed location and an alternative location for the southern terminal. The alternative location would impact more LRP soils than the proposed location for the southern terminal, and therefore may pose more revegetation and reclamation challenges than the proposed terminal location. **Table 3.3-3** summarizes the soil characteristics of soils within the disturbance footprint of the Southern Terminal.

Site-specific permanent impacts to soil quality and productivity would be expected from terminal construction. Through the implementation of the design features, BMPs, and mitigation measure **S-1**, and considering the upland locations of the terminals, little to no impacts related to erosion and sedimentation are expected.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Under Design Option 2, the location of the Southern Terminal would change. Design Option 2 would result in similar acres of initial and permanent disturbance to soil resources as described for the Proposed Action. Impacts would be similar to what is described in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components, except the Southern Terminal, Delta Ground Electrode Site, and AC/DC converter station would be located at IPP instead of the Marketplace Hub. Acreages of

Table 3.3-3 Soil Characteristics within the Disturbance Footprint of the Northern and Southern Terminal, Design Option 2 Terminal, and Design Option 3 Substation (acres)

Project Components	Region	Wind Erodible	Water Erodible	Compaction Prone	LRP	Hydric	Shallow Bedrock	Risk of Corrosion to Concrete	Risk of Corrosion to Steel	Shallow Excavations	Small Commercial Buildings	Expansive Soils
1-Northern Terminal Siting Area	I	718	917	992	2,500	0	75	0	4,422	0	0	229
1-Northern Terminal	I	23	87	91	114	0	3	0	229	0	0	22
4-Southern Terminal Siting Area	IV	472	0	0	2,031	0	15	278	3,527	3,416	3,527	0
4-Southern Alternative Terminal	IV	0	0	0	74	0	0	0	74	74	74	0
4-Southern Terminal	IV	0	0	0	0	0	0	0	78	78	78	0
3-Southern Terminal Siting Area near IPP (DO2)	III	211	0	463	1,100	0	0	1,100	1,100	637	319	463
3-Southern Terminal near IPP (DO2)	III	0	0	18	18	0	0	18	18	0	0	0
3-Substation near IPP (DO3)	III	0	0	43	43	0	0	43	43	0	0	0

[1] Limited Revegetation Potential.

Source: NRCS 2011.

surface disturbance would be similar; however, the location of disturbance would change. Similar impacts would be expected as described for the Northern Terminal. The southern substation at Eldorado Valley would be sited within one of the two terminal sites as described under the proposed action, therefore impacts would be the same as described for the proposed action.

Design Option 3 – Phased Build Out

Under Design Option 3, an additional substation would be constructed. Construction of Design Option 3 would entail construction of an additional Substation near IPP. Design Option 3 would result in the same acres of disturbance to soil resources as described for the Proposed Action. The phased build out would result in similar impacts to soil resources as described in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components. Phasing the construction would not have a direct effect to impacts on soil resources.

Operation Impacts

Because the entire site would be treated with a soil sterilizer (to prevent vegetation growth) and graveled, soil productivity and quality would be permanently altered. Soil compaction within the fenced areas and access road would continue due to continued movement of operation and maintenance vehicles and equipment. Soil contamination could occur due to potential spills. A Spill Prevention, Notification, and Clean-up Plan would be prepared as part of the COM Plan (TWE-57). Runoff and erosion would increase due to maintained compaction; however the BMPs described above for construction would help to reduce these impacts. In addition, BMPs PHS-9 through 17 would reduce the potential for hazardous waste release.

Decommissioning

If a terminal, substation, or regeneration station is no longer required, the buildings, structures and equipment would be dismantled and removed from the site. Reclamation of terminals and substation facilities would be difficult due to the sterilization of soils. Long-term topsoil stockpiles would result in a decrease in soil productivity and quality in the constructed long-term stockpiles. BMP GEN-14 would require the removal of gravel work pads. Additional mitigation measures **S-1**, **S-2**, **S-3**, and **S-4** are recommended to further mitigate impacts during reclamation and decommissioning.

S-4*: During decommissioning, where a soil sterilizer has been applied, sterile soils will be removed prior to the replacement of topsoil and seeding.*

Effectiveness: Removing chemically sterile soils before applying topsoil would help with revegetation success, should a terminal be decommissioned. Long-term soil quality and productivity would be altered at these sites, but through the application of BMPs, applicant committed design features, and additional mitigation, revegetating and reclaiming these sites to their original uses would be possible.

3.3.6.2 Impacts Common to all Alternative Routes and Associated Components

Potential direct and indirect effects related to construction, operation, maintenance, and decommissioning on soil resources are discussed below. If impacts remain after the application of applicant committed design features and BMPs and stipulations, additional mitigation is recommended to reduce or mitigate impacts.

Construction Impacts

In general, the impacts associated with construction of the transmission line would be temporary. Temporary disturbances would occur within the 250-foot-wide transmission line ROW from construction traffic along the ROW, material storage yards, batch plant sites, temporary staging areas, and work areas around each structure.

Direct impacts to soil resources would include the clearing or crushing of surface cover within the 250-foot-wide transmission line ROW (vegetation, duff, litter). Vegetation clearing would consist of cutting all vegetation over 6 feet in height within the 250-foot-wide transmission line ROW and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the 250-foot-wide transmission line ROW, and driving over the vegetation with construction equipment. Where woody material is chipped and left on the 250-foot-wide transmission line ROW, it may act as erosion control, providing the wood chips do not exceed 3 inches in depth. The effects of wood chip additions (at a 3-inch depth) on the soil resource include: increased soil temperature in the winter, moderate increase in soil moisture, and substantial decrease in soil nitrogen supply and understory vegetation. The increase in soil temperature and soil moisture would have relatively minor ecological effects. However, reductions in the soil N supply may temporarily reduce productivity of the soil and affect revegetation rates (Binkley et al. 2003). With increasing depth of woodchips, these impacts will increase in magnitude and duration.

Grading and leveling would be required to construct structures and for temporary work areas, staging areas, fly yards, and concrete batch plants, with the greatest level of effort required on more steeply sloping areas. During construction, the soil profiles would be mixed with a corresponding loss of soil structure. BMPs that would reduce impacts associated with grading include:

- SOIL-1 requires the salvage, safeguarding, and reapplication of topsoil from all excavations and construction activities.
- SOIL-2 requires site-specific and specialized construction techniques for areas of steep slopes, biological soil crusts, erodible soil, and stream channel crossings.
- SOIL-3 requires the applicant to backfill foundations and trenches with originally excavated material as much as possible. Excess excavation materials should be disposed of by the applicant only in approved areas.

Soil compaction would result from the movement of heavy equipment and vehicles during construction activities. Soil compaction and a reduction in ground cover would lead to an increase in bulk density, increased runoff, and erosion. Mitigation measure **S-1**, **S-2**, and **S-3** would help to prevent or mitigate compaction to the depth of compaction, as described in Section 3.3.6.1. Rutting or soil mixing could occur when soils are saturated. Rutting affects the surface hydrology of a site as well as the rooting environment. The process of rutting reduces the aeration and infiltration of the soil, thereby degrading the rooting environment. Rutting may result in soil mixing of topsoil and subsoil, thereby reducing soil productivity. Rutting also disrupts natural surface water hydrology by damming surface water flows or by diverting and concentrating water flows creating accelerated erosion. Soil mixing typically results in a decrease in soil fertility and a disruption of soil structure. Additional mitigation measure **S-5** would help to reduce the potential for rutting and soil mixing. The potential for erosion would increase through the loss of vegetation cover as compared to an undisturbed state. Reclamation and erosion control would be difficult on soils that occur on steeper sloping areas (15 percent or more), particularly those steeper sloping areas over shallow soils (20 inches or less to bedrock). Steep slopes crossed by the project alternatives are shown in Section 3.2 on **Figures 3.2-2**, **3.2-6**, and **3.2-11**.

S-5*: Surface activities are prohibited when soils or road surfaces become saturated to a depth of 3 inches or less if mixing of the topsoil and subsoil will occur or the soil surface becomes unsafe for vehicular travel.*

Effectiveness: This measure would reduce the potential for mixing of topsoil and subsoil and reduce the potential for soil displacement, compaction, and rutting.

Soils with unfavorable properties, including thin topsoil layers, moderate to strong salinity and alkalinity, very clayey or sandy surface or subsoils, and shallow depths over bedrock are common and would present problems for erosion control and revegetation. Badlands also would present reclamation challenges due to the difficulty in stabilization of disturbances in these areas. Based on structure spacing of 700 to 1,500 feet, sensitive areas (such as hydric soils or badlands) could generally be spanned.

Surface restoration would occur as required by the landowner or managing agency, returning the disturbed areas back to their natural contour, reseeding, and installing erosion control if necessary (TWE 13). Runoff from excavated areas would be controlled (TWE 22). Areas that do not require re-contouring would have vegetation left in place wherever possible to maintain vegetation roots and increase soil stability (TWE 27). BMPs such as silt fences and check dams would further minimize this impact by trapping sediments or slowing the flow (BMP WAT-9).

***S-6**: During construction, erosion control measures will be inspected after every storm event and maintained.*

Effectiveness: Erosion controls are only effective if they are maintained. Monitoring of erosion controls after storm events would keep erosion control in effective working order and reduce or prevent sediment from moving off-site. Implementation of design features, BMPs, and mitigation measure **S-6** would effectively control erosion from disturbed areas reducing the loss of surface soils and potential sedimentation effects.

Long-term impacts to vegetation are anticipated associated with regular vegetative clearing, specifically in areas with deciduous or coniferous tree species. Modifying vegetation types (e.g. converting a forested area to grass) would modify soil productivity and soil development. BMPs REST-1 and -2 would require reclamation of vegetation, species composition, and diversity. Although long-term soil productivity would be altered, nutrient cycling would continue due to the continual addition of leafy vegetative litter associated with grass or shrub species.

While the exact locations of access roads are not known, general impacts associated with construction of access roads are described in the subsequent text. Access road construction typically would occur within the 2-mile transmission line corridor as described in **Appendix D**, Section 3. A summary of soil characteristics within the corridor is provided in the discussion specific to each region below. Construction of new access roads would begin with vegetation removal. Smaller vegetation would be lopped and scattered outside the road construction area. For bladed roads, topsoil would be removed and salvaged from the road construction area as required by the appropriate land management agency or private landowner. Topsoil would be stored adjacent to the road or in a nearby workspace. Topsoil would be prone to erosion until adequate erosion controls are applied or topsoil piles are revegetated. Where the topography is relatively flat and grading occurs, soil mixing would be limited to the upper subsurface soil horizons. Where cut and fill slopes occur, the deeper subsurface soil profiles would be mixed with a corresponding loss of soil structure. Soil compaction would considerably impact the upper profile subsoils immediately beneath the road surface but also would impact subsurface soils at a greater depth if fine textured soils are present. Soil compaction would result in a corresponding loss of infiltration, permeability, and soil aeration. Runoff and soil erosion would increase as a result of compaction, particularly on steeper grades such as Category 5 and 6 roads described in **Appendix D**, Section 3. Where road surfacing is applied, this impact would be reduced. As needed, the access roads would be bladed/graded to allow for safe access and construction, which would loosen soils and make them susceptible to erosion. An indirect effect of new access roads is an opportunity for increased access by recreational users. Where public access is increased an increase in bare ground would be expected, along with additional compaction, erosion, sedimentation, and a decline in soil quality.

TWE has committed to install appropriate erosion control devices to prevent erosion or loss of the topsoil, including measures to prevent wind erosion and fugitive dust, and silt fencing to prevent sediment runoff. In addition, TWE has committed to develop an Erosion Control Plan (TWE-19). Access road construction would be avoided on steep hillsides and near watercourses where alternate routes provide adequate access. Where long term surface occupancy occurs (facility sites, permanent roads, etc.), access roads would be upgraded and maintained as necessary to prevent soil erosion and accommodate year round traffic; all disturbed areas unnecessary to operations would be stabilized, and all disturbed areas outside the work area would be seeded with an agency approved seed mixture. Erosion controls such as jute netting, silt fences, and check dams would further minimize erosion and sedimentation impacts (WAT-9).

***S-7**: Permanent access roads would not be constructed on slopes over 25 percent.*

Effectiveness: Accelerated erosion and road failure increases on steep slopes. This mitigation measure is a preventive measure to reduce impacts associated with access roads. Implementation of mitigation measures, design features, and BMPs would effectively reduce or minimize runoff and accelerated erosion from roads.

***S-8**: Temporary and permanent access roads would be gated to restrict motorized use by the public. In some instances, other methods may need to be employed to prevent public access. After construction is complete, permanent access roads would remain gated at the land management agency or landowner's discretion. If the road is no longer needed for operations, it would be obliterated with the following procedures:*

1. Remove all stream crossings and restore stream banks to natural contours;
2. Reestablish natural drainage patterns;
3. Decompact the road surface by subsoiling along the entire disturbed length;
4. Recontour the road prism to the original land contours;
5. Seed with an agency or landowner approved seed mixture; and
6. Gates and closure signage should be left in place until adequate regeneration/rehabilitation occurs.

Effectiveness: Implementation of gating and other closure methods would help to reduce public access and impacts associated with trespass.

Borrow pits would be stripped of topsoil to a depth of approximately 6 inches. Stripped topsoil would be stockpiled and, upon completion of borrow excavation, spread to a uniform depth of 6 inches over the areas from which it was removed. Before replacing topsoil, excavated surfaces would be reasonably smooth and uniformly sloped. The sides of borrow pits would be brought to stable slopes with slope intersection shaped to carry the natural contour of adjacent undisturbed terrain into the pit to give a natural appearance. When necessary, borrow pits would be drained by open ditches to prevent accumulation of standing water. Topsoil excavation, transport, storage, and redistribution would modify existing microbial populations and soil structure, generating adverse impacts relative to aeration and permeability. It is likely that some mixing of textural zones would occur. Topsoil would be re-spread over the remaining subsoils and seeded. Subsoils in the arid west have the potential to have an increase in saline, sodic, and/or strongly alkaline materials. Depending on the amount of topsoil that is re-spread, this may create adverse chemical impacts to soils for seedbeds. Due to these probable effects, the initial soil quality of reconstructed seedbeds and root zones would be less than that of the existing soil resources. Agency BMPs would require the applicant to obtain borrow (fill) material only from authorized sites. Existing sites should be used in preference to new sites. One BMP (see **Appendix C**) requires all suitable topsoil to be stripped from the surface of the location and stockpiled for reclamation once the location is abandoned. When topsoil is stockpiled on slopes exceeding five percent, construct a berm or trench below the stockpile. BMP SOIL-4 would require the applicant to obtain borrow (fill) material only from authorized sites. Existing sites would be used in preference to new sites. Although topsoil would be stripped at all disturbed sites there is still potential for site specific impacts to soil quality at borrow sites. Additionally, a depression would be left ultimately changing the hydrologic regime at the site.

Soil contamination could result from material or fuel spills during construction activities. If large spills occur, contamination could result in the removal and disposal of large amounts of soil. Saturated soils have the potential to disperse contaminants to groundwater or surface water. BMPs PHS-9 through -17 and design features TWE-57 through -62 would reduce the potential for hazardous waste release along the ROW. The application of design features and BMPs would help to reduce the risk of an accidental spill or release

of hazardous materials. The BMPs and design features may not fully prevent soil contamination, but they would reduce the potential for soil contamination and help to meet state and federal requirements.

Construction of the transmission line would result in areas of localized permanent impacts associated with the structure foundations and regeneration sites. Localized long-term impacts to soils would result from loss of surface lands and soil productivity and quality due to installation of structure foundations. Losses of prime farmland could occur if structure foundations or facilities are required in prime farmlands. Acreage of permanent disturbance associated with each alternative is described in Section 3.3.6.9, Irreversible and Irretrievable Commitment of Resources.

In areas where single shaft tubular steel pole structures are used, increased volumes of excavated subsoil spoils may require spreading beyond the general disturbance area. In these areas, topsoil would be salvaged and set aside to be placed over the subsoil material during restoration. Spoil material would be used for backfill where suitable, and the remainder would be spread at the structure site or along graded access roads or in locations previously agreed upon by the Applicant and the appropriate land management agency or private landowner. Subsoils in the arid west are commonly characterized as having high pH, salts, and sodium. If excess subsoils are spread or redistributed on the soil surface undesirable chemical or physical soil characteristics could create adverse impacts to soil quality for seedbeds and reclamation. BMP SOIL-1 would require TWE to salvage, safeguard, and reapply topsoil from all excavations and construction activities. Additionally foundations and trenches must be backfilled with the originally excavated material to the extent possible. Excess excavation materials should be disposed of by the applicant only in approved areas (SOIL-3).

S-9*: Excess subsoil that is excavated for foundations would not be spread on the soil surface (on top of topsoil) or on access roads. Excess subsoil would be disposed of in accordance with federal, state, and local requirements.*

Effectiveness: If soil mixing of topsoil and subsoil is successfully prevented the soil quality and productivity of native topsoil would be maintained. Implementation of BMPs and mitigation measure **S-9** would prevent the contamination or dilution of topsoil with physical or chemically unsuitable subsoil materials.

These following project facilities would be within the 250-foot-wide transmission line ROW and the soils encountered at these sites are discussed by region and alternative below. Two ground electrode facilities are proposed, one connecting to the Northern Terminal and one connecting to the Southern Terminal. The ground electrode facilities would result in a long-term soil disturbance of approximately 0.5 acre at each location. The center of the electrode containing the control house would be fenced. Permanent impacts to soil quality and productivity would be expected within the fenced area. The ground electrode site at Mormon mesa is situated on old soils that contain thick petrocalcic horizons. Over time carbonates have been transported into the subsoil by water that precipitates the carbonates in the subsoil upon evaporation, eventually forming a massive, continuous layer of cemented carbonates. These soils may pose construction challenges and would be corrosive to concrete and metal. Agricultural land uses outside the fenced area, such as grazing and cultivated crops, would be permissible.

Communication regeneration sites would consist of small buildings located within a fenced graveled site. In total, approximately 15 to 20 regeneration sites would be required for the proposed TWE Project. In most cases, the regeneration communication sites would be located within the 250-foot-wide transmission line ROW and typically would be 100 feet by 100 feet in size. The communication regenerations sites would result in a long-term disturbance to soil resources due to the soils being taken out of production and compacted resulting in a long-term loss of soil productivity.

At the conclusion of construction activities, TWE has committed to disk compacted soils in cultivated agricultural areas and scarify road surfaces being reclaimed. Disking does not mitigate compaction, but would break up large soil clods near the surface and help to prepare the seed bed. Scarification breaks up the surface layer of soil and is not an adequate decompaction tool except on shallow soils. On deeper

soils, compaction would remain at depth and water would infiltrate through the soil surface but would not penetrate the compacted subsoil layer. This would result in a lateral subsurface flow of water, which could carry surface soil with it on sloping areas. In addition, **S-3** would require decompaction to the depth of compaction. Additionally, GEN-14 would require the removal of gravel work pads that were used during construction.

At all permanent facilities, BMP SOIL-1 would require topsoil salvage, safeguarding, and reapplication from all excavations and construction activities. GEN-14 would require the removal of gravel work pads that were used during construction. AIR-1 would help to protect salvaged topsoil from erosion and degradation.

***S-10**: Prime farmlands will be avoided to the extent possible for permanent project facilities and structure foundations.*

Effectiveness: Avoidance of prime farmlands for structures or permanent Project facilities would reduce but not fully mitigate the loss of prime farmlands. It may not be possible to completely avoid prime farmlands. Where Project facilities or structure foundations impact prime farmland, the soil resources would be lost and permanently removed from production.

Interim reclamation would occur after construction activities are complete. Reclamation failure, consisting of unsuccessful revegetation efforts, substantial soil erosion, or slumping, would be handled in accordance with each agency's specific guidelines (**Appendix C**) or landowner requirements.

Operation Impacts

Traffic on native surface roads during operations would result in soil compaction or rutting if soils are saturated. Rutting occurs when the soil strength is not sufficient to support the applied load from vehicle traffic. Rutting disrupts surface water hydrology by diverting and concentrating water flows and would cause accelerated erosion and sedimentation to connected waterbodies. If permanent access roads do not have adequate erosion controls or the roads are not properly maintained, the roads would degrade and erode. Where long-term access is required for maintenance of the line, TWE has committed to maintain the approved access roads in a safe, useable condition, as directed by an authorized officer from the appropriate land management agency or private landowner.

***S-11**: Permanent erosion control measures will be installed on all project access roads used for operations and maintenance. Erosion control measures will be inspected and maintained bi-annually.*

Effectiveness: The construction of permanent erosion control on all project access roads required for operations and maintenance would reduce the potential for off-site impacts associated with erosion and sedimentation to nearby waterways. In addition, it would help to prevent road washout, rilling, and down-cutting. If permanent erosion controls are installed and maintained on permanent access roads it would reduce the potential for degradation of native surface roads and sedimentation issues off-site.

Any surface disturbing activities along the ROW for operations or maintenance, would result in the reduction of protective soil cover such as vegetation, duff, and litter due to trampling or removal. Travel along the ROW would cause soil compaction, which would result in a corresponding loss of infiltration, permeability, and soil aeration. Runoff and soil erosion would increase as a result of compaction and a reduction in soil cover. Potential soil productivity impacts would result during maintenance operations along the ROW or at aboveground facilities from wind and water erosion of topsoil or soil mixing. These activities would occur intermittently and impacts would be localized to areas where maintenance occurs.

Where new access roads are built and maintained for operations there is some potential for indirect impacts to soil resources by trespass of the public onto the access roads. Access roads could provide access to the 2-mile transmission line corridor and to previously inaccessible areas along the length of the

road. This is particularly evident where the natural vegetation levels are low and large open areas occur. Evidence of unauthorized cross country travel remains long after it occurs and subsequent users would follow the tracks increasing the potential for loss of vegetation, soil compaction and erosion in areas where no roads previously existed.

Soil contamination could occur during maintenance activities due to fuel or lubricant spills. If spills occur along the ROW they would result in localized impacts and could result in removal of contaminated soils.

BMPs and design features that would reduce impacts to soil resources during operation include the following:

- PHS-11 would require secondary containment for all on-site hazardous materials and waste storage areas.
- PHS-12 would ensure that wastes are properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.
- PHS-13 would require the applicant to initiate spill cleanup procedures and document the event, including a cause analysis; appropriate corrective actions taken; and a characterization of the resulting environmental or health and safety impacts. Documentation of the event should be provided to the land management agency's authorized officer and other federal and state agencies, as required.
- TWE-57: A Spill Prevention Notification and Clean-up Plan would be developed. The Plan would address compliance with all applicable federal, state, and local regulations, and would include: spill prevention measures, notification procedures in the event of a spill, employee awareness training, and commitment of manpower, equipment, and materials to respond to spills, if they occur.
- TWE-58: A Pesticide Use Plan would be developed. The Plan would address compliance with all applicable federal, state and local regulations.
- TWE-59: A Clean-up Work Management Plan would be developed. The plan would address on-site excavation of contaminated soils and debris and would include: identification of contaminants, methods of excavation, personnel training, safety and health procedures, sampling requirements, management of excavated soils and debris, and disposal methods.
- TWE-61: A Hazardous Materials Management Plan would be developed. Hazardous materials would not be drained onto the ground or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials.
- TWE-62: If a reportable release of hazardous substance occurs at the work site, the Contractor would immediately notify the Applicant and all environmental agencies, as required by law. The Contractor would be responsible for the clean-up.

The application of design features and BMPs would help to reduce the risk of an accidental spill or release of hazardous materials. The BMPs and design features may not fully prevent soil contamination, but they would reduce the potential for soil contamination and help to meet state and federal requirements.

Decommission Impacts

Impacts during decommissioning would be similar to the impacts described for the construction phase of the project. During decommissioning, conductors, insulators, and hardware would be dismantled and removed from the ROW. Structures would be removed and foundations removed to below-ground surface. The 250-foot-wide transmission line ROW would have similar impacts to what is described for the construction phase of the project. TWE proposes to abandon foundations in place or just below the ground

surface. This would result in permanent site specific impacts to soils. BMP GEN-16 would require all foundations to be removed to a minimum depth of 3 feet. Any concrete foundation left below the subsurface of the soil would create an artificial impervious layer that would change the hydrologic function of the soil. Additionally, it creates an artificial plane of weakness above the foundation creating potential for mass wasting. If terminals, substations, or regeneration stations are no longer required, the buildings, structures, and equipment would be dismantled and removed from the site. Foundations would be either abandoned in-place or cut off below ground level and buried. If foundations are abandoned in place there would be a permanent loss of soil resources at these locations. The ground electrode site at Morman Mesa is situated on old soils that contain thick petrocalcic horizons. These soils may pose reclamation challenges during decommissioning due to high carbonates and shallow to moderately deep eolian soils.

***S-12**: All concrete foundations will be removed during decommissioning, unless they are permanently anchored into stable bedrock.*

Effectiveness: Removal of the concrete foundations would reduce the potential for mass wasting and erosion of the soil above the concrete foundation. It also would allow for natural root growth of vegetation. If the concrete foundation is completely removed it would help to restore the hydrologic function of the soil back to its original state. This would increase the potential for reclamation success.

Decommissioning and reclamation of access roads following abandonment would be completed in accordance with the landowner's or land agency's direction.

***S-13**: Follow-up seeding using native seed or corrective erosion control measures are required on areas of surface disturbance that experience reclamation failure.*

Effectiveness: In locations where reclamation is unsuccessful, follow-up revegetation efforts would help to restore soil productivity and prevent the loss of topsoil.

BMPs and design features that would reduce impacts to soil resources during decommissioning include the following:

- BMP REST-1: topsoil removed during decommissioning activities shall be salvaged and reapplied during final reclamation; all areas of disturbed soil shall be reclaimed using weed-free native shrubs, grasses, and forbs or other plant species approved by the land management agency; grades would be returned to pre-development contours to the greatest extent feasible.
- BMP MIT-3: the decommissioning plan would include a site reclamation plan and a monitoring program.
- BMP GEN-14: Gravel work pads would be removed and disposed.
- GEN-16: equipment, components, and aboveground structures must be cleaned and removed from the site for reclamation, salvage, or disposal; all below-ground components would be removed to a minimum depth of 3 feet to establish a root zone free of obstacles.
- TWE-3: the COM Plan will include a mitigation monitoring plan that will address how each mitigation measure required by permitting agencies in their respective decision documents and permits will be monitored for compliance.

Measures **S-1**, **S-2**, **S-3**, **S-4**, **S-6**, **S-8**, **S-9**, and **S-12** as described in Sections 3.3.6.1 and 3.3.6.2 would be recommended to mitigate impacts associated with decommissioning. The application of BMPs, design features, and additional mitigation would reduce impacts to soil resources.

3.3.6.3 Region I

Region I would have impacts similar to what is described in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components. **Table 3.3-4** provides a summary of the data sources used for analysis in Region I. As stated in Section 3.3.2, detailed order 3 SSURGO soil survey data were utilized where available; all other areas were characterized using U.S. General Soil Map data. **Table 3.3-5** provides a comparison of impacts associated with the construction and operation of alternative routes in Region I. **Table 3.3-6** provides details of water erosion-prone soils impacted by construction and operation by watershed (HUC10; NRCS et al. 2010).

Table 3.3-4 Region I Data Sources Used for Analysis

Alternatives	Miles		Total Miles[1]	Percentage	
	SSURGO	GSM		SSURGO	GSM
Alternative I-A	111	44	155	71	29
Alternative I-B	104	55	159	66	34
Alternative I-C	162	24	186	87	13
Alternative I-D	123	49	171	72	28
Connectors					
Mexican Flats	8	2	10	83	17
Baggs	6	17	22	26	74
Fivemile Point North Alternative Connector	3	0	3	100	0
Fivemile Point South Alternative Connector	2	0	2	100	0

[1]Discrepancies in totals due to rounding error.

Table 3.3-5 Summary of Impacts to Soils by Alternatives in Region I

Parameter	Alternative I-A		Alternative I-B		Alternative I-C		Alternative I-D	
	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
Water Erosion-Prone	259	69	271	68	301	75	269	65
Wind Erosion-Prone	231	60	239	57	270	72	238	56
Compaction-Prone	579	150	525	133	947	237	706	169
LRP[1]	741	187	786	184	558	129	913	208
Hydric[2]	0	0	0	0	7	2	0	0
Prime Farmland	129	37	136	36	293	80	136	36
Shallow Bedrock[3]	274	70	211	49	288	63	348	79
Risk of Corrosion (Concrete)	330	86	358	88	256	64	359	89
Risk of Corrosion (Steel)	1,113	287	1,108	266	1,243	309	1,089	256
Shallow Excavation Limitations	570	155	612	150	819	214	497	127
Small Commercial Building Limitations	762	207	731	184	1,178	310	681	173
Expansive Soils	213	57	187	49	350	91	283	69

[1] Limited Revegetation Potential.

[2] Wet Soils.

[3] Lithic Bedrock 60 inches or less from the soil surface.

Source: NRCS 2011.

Note: GSM data did not have interpretations for hydric soils, shallow excavations, small commercial buildings, or prime farmland. Percentages for these interpretations exclude areas with only GSM data.

Table 3.3-6 Project Impacts to Water Erosion-Prone Soils by Watershed in Region I

General Region I		I-A		I-B		I-C		I-D		Tuttle Easement Micro-siting Option 1		Tuttle Easement Micro-siting Option 1 - Comparison		Tuttle Easement Micro-siting Option 2		Tuttle Easement Micro-siting Option 2 - Comparison		Tuttle Easement Micro-siting Option 3		Tuttle Easement Micro-siting Option 3 - Comparison		Mexican Flats Alternative Connector		Baggs Alternative Connector		Fivemile Point North Alternative Connector		Fivemile Point South Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1405000505	Crooked Wash-White River	1	0	1	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0								
1405000204	Deception Creek-Yampa River					23	6																						
1405000111	Dry Creek-Yampa River					26	7																						
1405000106	Elkhead Creek					13	3																						
1405000107	Fortification Creek					61	15																						
1405000305	Fourmile Creek					46	11																						
1404020004	Frewen Lake	1	0	0	0	10	2	1	0																				
1405000309	Greasewood Gulch-Little Snake River	73	21	78	20			78	20	79	22	74	18	80	22	74	18	80	22	74	18								
1405000206	Hells Canyon-Yampa River	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1								
1018000210	Iron Springs Draw-North Platte River	0	0	0	0	0	0	0	0																				
1405000308	Little Snake River-Powder Wash	37	10	35	9			40	10	1	0	1	0	1	0	1	0	1	0	1	0			25	5				
1405000302	Little Snake River-Willow Creek					16	4	0	0															27	7			1	0
1405000403	Lower Muddy Creek					18	4	6	1															9	2	14	1		
1405000307	Lower Sand Creek	18	5	23	5			36	6															18	5				
1405000202	Morgan Gulch-Yampa River					36	9																						
1405000311	Outlet Little Snake River	0	0																										
1405000402	Red Wash	13	3	15	3	1	0	1	0													4	1						
1405000310	Sand Wash	2	1																										
1405000205	Spring Creek-Yampa River	16	4	13	4	25	7	13	4	18	4	13	4	10	3	13	4	11	3	13	4								
1018000213	Sugar Creek	48	11	48	11	48	11	48	11																				

Table 3.3-6 Project Impacts to Water Erosion-Prone Soils by Watershed in Region I

General Region I		I-A		I-B		I-C		I-D		Tuttle Easement Micro-siting Option 1		Tuttle Easement Micro-siting Option 1 - Comparison		Tuttle Easement Micro-siting Option 2		Tuttle Easement Micro-siting Option 2 - Comparison		Tuttle Easement Micro-siting Option 3		Tuttle Easement Micro-siting Option 3 - Comparison		Mexican Flats Alternative Connector		Baggs Alternative Connector		Fivemile Point North Alternative Connector		Fivemile Point South Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1405000401	Upper Muddy Creek					1	0	0	0													0	0						
1405000306	Upper Sand Creek			6	1																								
1404020013	Upper Separation Creek	47	12	47	12	58	14	47	12																				
1405000701	Wolf Creek	60	16	60	16	60	16	60	16	53	13	60	16	53	13	60	16	53	13	60	16								

Notes: Discrepancies in totals may occur due to rounding.
Blanks denote no impacts.

Source: NRCS 2011; NRCS et al. 2010.

Alternative I-A (Applicant Proposed)

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 71 percent of Alternative I-A. The remaining 29 percent was analyzed using U.S. GSM data. The primary constraints for Alternative I-A during construction would be disturbance of 741 acres of soils with limited revegetation potential and 579 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, and **S-13** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (1,113 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative I-B

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 66 percent of Alternative I-B. The remaining 34 percent was analyzed using U.S. GSM data. The primary constraints for Alternative I-B during construction would be disturbance of 786 acres of soils with limited revegetation potential and 525 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, and **S-13** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (1,108 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative I-C

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 87 percent of Alternative I-C. The remaining 13 percent was analyzed using U.S. GSM data. The primary constraints for Alternative I-C during construction would be disturbance of 558 acres of soils with limited revegetation potential and 947 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, and **S-13** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (1,243 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative I-D (Agency Preferred)

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 72 percent of Alternative I-D. The remaining 28 percent was analyzed using U.S. GSM data. The primary constraints for Alternative I-D during construction would be disturbance of 913 acres of soils with limited revegetation potential and 706 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, and **S-13** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (1,089 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

The Tuttle Easement micro-siting options 1, 2, and 3 would result in similar impacts to soil resources. In general, soil limitations along the micro-siting options 1, 2, and 3 are similar to Alternative I-D. However, micro-siting options 2 and 3 would impact more prime farmland soils than Alternative I-D.

Alternative Connectors in Region I

Table 3.3-7 summarizes the characteristics of soils that would be impacted by the various connectors and advantages associated with the alternative connectors in Region I.

Table 3.3-7 Summary of Region I Alternative Connector Impacts for Soils

Alternative Connector	Analysis	Advantage
Mexican Flats Alternative Connector	Approximately 2 acres of water erodible, 17 acres of wind erodible, 72 acres of LRP, 48 acres of compaction prone, and 52 acres of shallow soils would be impacted during construction if this alternative connector were used.	Less LRP, compaction prone, and erodible soils are located on the Alternative C route compared to the Alternative A or B route. Less compaction prone soils are located on Alternative A than on Alternative B. The connecter would help reduce impacts to the soils on Alterative A or B if the alternate connector was utilized. However, the acreage of soils disturbed would increase if the connector were used to cross over to the Alternative C route.
Baggs Alternative Connector	Approximately 64 acres of water erodible, 1 acres of wind erodible, 38 acres of soils with shallow bedrock, 167 acres of LRP, and 126 acres of compaction prone soils would be impacted during construction if this alternative connector were used.	This connector route would reduce the overall acres of soil resources impacted by Alternative C. This would be a benefit to soil resources.
Fivemile Point North Alternative Connector	Approximately 50 acres of LRP, 26 acres of compaction prone, and 26 acres of shallow soils would be impacted during construction if this alternative connector were used. No water or wind erosion-prone soils would be impacted.	This connector route would reduce the overall acres of soil resources impacted by Alternative C. This would be a benefit to soil resources.
Fivemile Point South Alternative Connector	Approximately 19 acres of LRP, 10 acres of compaction prone, and 5 acres of shallow soils would be impacted during construction if this alternative connector were used. No water or wind erosion-prone soils would be impacted.	This connector route would reduce the acres of soil resources impacted by Alternative C. This would be a benefit to soil resources.

Alternative Ground Electrode System Locations in Region I

Table 3.3-8 summarizes disturbance impacts associated with ground electrode systems in Region I.

Table 3.3-8 Summary of Region I Alternative Ground Electrode System Impacts (Acres)[1]

	Wind Erodible	Water Erodible	Compaction Prone	LRP	Hydric	Prime Farmland	Shallow Bedrock	Risk of Corrosion - Concrete	Risk of Corrosion - Steel	Shallow Excavations	Expansive Soils
Little Snake East (Alternatives I-A, I-B, and I-D)	207	19	67	19	0	0	72	19	250	506	0
Little Snake West (Alternative I-A)	90	0	299	253	0	0	0	274	494	213	21
Little Snake West (Alternatives I-B and I-D)	90	0	299	253	0	0	0	274	494	213	0

Table 3.3-8 Summary of Region I Alternative Ground Electrode System Impacts (Acres)[1]

	Wind Erodible	Water Erodible	Compaction Prone	LRP	Hydric	Prime Farmland	Shallow Bedrock	Risk of Corrosion - Concrete	Risk of Corrosion - Steel	Shallow Excavations	Expansive Soils
Separation Creek	0	39	112	320	0	0	127	233	339	0	16
Separation Flat (All Alternative Routes)	150	0	0	360	0	0	0	0	600	0	0
Shell Creek (Alternative I-B)	138	42	162	462	0	0	0	42	582	0	90
Eight Mile Basin	0	221	305	443	0	0	83	0	526	0	55

[1] Limited Revegetation Potential

[2] Wet Soils

[3] Lithic Bedrock 60 inches or less from the soil surface.

Note: Acreages are based on 600-acre siting areas, but much smaller areas within the siting areas would be required for the facilities as shown in Chapter 2.0, **Table 2-8**.

Region I Conclusion

As presented in **Table 3.3-5**, Alternative I-C would have the greatest impacts on soil resources. Alternative I-C would impact more compaction prone soils, hydric soils, prime farmland, soils prone to shrink-swell, wind and water erodible soils, soils with severe limitations associated with shallow excavations, and soils that are corrosive to steel than the other alternatives. Alternative I-D would impact more LRP, soils with shallow bedrock, and soils corrosive to concrete. In general, Alternative I-A and I-B would have the least overall impact on soil resources.

3.3.6.4 Region II

Region II would have impacts similar to those discussed in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components.

Soils within the San Rafael Swell and throughout the Green River and Grand Valley areas weathered from sedimentary materials (primarily shale, sandstone, and limestone deposits) containing large amounts of selenium, calcium carbonate, and soluble salts. These soils are susceptible to the development of large sinkholes, piping, and subsidence. In addition, these soils have limited revegetation potentials, are corrosive to both cement and steel structures, are highly susceptible to wind and water erosion, and surface puddling. Stabilization and revegetation of these soils following surface disturbance would be difficult.

Alternatives II-A, II-B, II-C, II-D, II-E, and II-F each cross areas of fine textured soils derived from the North Horn Formation. These soils weathered from calcareous claystone, siltstone, mudstone, deposits. During periods of high moisture, soils on steep slopes (**Figure 3.2-8**) become unstable resulting in soil creep, slumping, or large landslides. These soils create hazards for transmission line structures and associated facilities. In addition, where construction modifies the slope face (cut and fill) the incidence for slope failure increases. Landslide susceptibility and incidence in Region II is illustrated on **Figure 3.2-8**. Roads, structures, and facilities would risk damage and loss of service due to unstable soils hazards in Region II. Hazards associated with unstable soils and bedrock are discussed further in Section 3.2.6, Impacts to Geological, Mineral, and Paleontological Resources.

Alternatives II-A, II-D, and II-E each cross areas of sand dunes along segments 360 and 430. Dune lands consist of sand in ridges and intervening troughs that constantly shift with the wind. These soils are highly wind erodible. Blowouts may also be common in these areas and consist of areas from which all or most of the soil material has been removed by extreme wind erosion. Siting towers in these areas could result in towers being buried by dunes or blowouts at the tower site. Biological soil crusts are highly susceptible to disturbance, especially in sandy soils (Belnap and Gardner 1993). Recovery rates are generally slow, specifically for lichen and moss recovery, which can take 45 to 250 years respectively (Belnap and Gillette 1997). Losses of biological soils crusts would be expected where surface disturbance occurs. Surface roughness or crusts (biological or physical) would be damaged by construction activities (i.e., clearing, grubbing, excavation, vehicle traffic) and are likely to be susceptible to wind or water erosion even if they are not rated erosion prone. Disturbed soils that are not successfully reclaimed or stabilized are likely to lose productivity and the ability to sustain vegetation over the long term, which would reduce watershed health and contribute to sedimentation in surface water or degradation of local air quality. It is not possible to quantify or locate all of the areas where this may occur. Losses in soil productivity due to wind erosion are most likely to occur on soils that are saline or alkaline, fine-textured, and formed in some lake sediments.

BMPs that would reduce impacts to soil resources include the following: BMP PHS-6 (applicants would develop a comprehensive emergency plan that considers the vulnerabilities of their energy system to all credible events initiated by natural causes…); and BMP PHS-4 (health and safety program shall establish a safety zone or setback from roads and other public access areas that is sufficient to prevent accidents resulting from various hazards).

***S-14**: TWE would avoid constructing in areas of unstable soils prone to slumping or mass wasting. Prior to construction, a hazard plan would be developed by TWE depicting the landslide-prone avoidance areas. This plan would be included in the POD submitted to the agencies for approval prior to the Notice to Proceed.*

Effectiveness: Avoidance of unstable slopes is the best way to prevent impacts to the transmission line and facilities associated with landslides, slumping, and soil creep. Avoidance of landslide prone soils would reduce but may not fully mitigate impacts associated with soils prone to slumping or soil creep. Catastrophic events may not always be predictable, but avoidance of known unstable areas would help to reduce impacts.

Table 3.3-9 provides a summary of the data sources used for analysis in Region II. As stated in Section 3.3.2, detailed order 3 SSURGO soil survey data were utilized where available; all other areas were characterized using U.S. GSM data. **Table 3.3-10** provides a comparison of impacts associated with the construction and operation of alternative routes in Region II. **Table 3.3-11** provides details of water erosion-prone soils impacted by construction and operation by watershed (HUC 10; NRCS et al. 2010).

Table 3.3-9 Region II Data Sources Used for Analysis

Alternatives	Miles		Total Miles[1]	Percentage	
	SSURGO	GSM		SSURGO	GSM
Alternative II-A	168	89	257	65	35
Alternative II-B	305	40	345	88	12
Alternative II-C	316	48	364	87	13
Alternative II-D	214	48	262	82	18
Alternative II-E	167	100	266	63	37

Table 3.3-9 Region II Data Sources Used for Analysis

Alternatives	Miles		Total Miles[1]	Percentage	
	SSURGO	GSM		SSURGO	GSM
Alternative II-F	173	94	267	65	35
Connectors					
Castle Dale Alternative Connector	11	0	11	100	0
Price Alternative Connector	18	0	18	100	0
Lynndyl	24	0	24	100	0
IPP East	3	0	3	100	0
Connector					
Highway 191	0	5	5	0	100
Variation					
Emma Park	15	20	35	42	58
Alternative II-F Comparable	0	32	32	0	100
Variations					
Strawberry A	0	74	74	0	100
Strawberry A comparable	0	74	74	0	100
Strawberry B	0	74	74	0	100
Strawberry B comparable	0	74	74	0	100
Strawberry C	0	74	74	0	100
Strawberry C comparable	0	74	74	0	100
Cedar Knoll A	23	5	28	81	19
Cedar Knoll A comparable	21	7	28	77	23
Cedar Knoll B	24	5	29	84	16
Cedar Knoll B comparable	21	7	28	76	23

[1] Discrepancies in totals due to rounding.

Table 3.3-10 Summary of Impacts to Soils by Alternatives in Region II

Parameter	Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F	
	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
Water Erosion-Prone	194	73	580	159	612	160	252	75	246	75	257	79
Wind Erosion-Prone	247	58	152	38	167	38	280	68	247	57	210	53
Compaction-Prone	1,214	410	2,013	572	1,929	506	1,317	401	1,137	364	1,361	446
LRP[1]	1,092	325	1,921	494	2,351	605	1,081	291	1,045	278	1,247	356
Hydric[2]	50	13	73	19	74	17	26	7	36	9	51	12
Prime Farmland	347	95	413	117	484	120	279	90	278	85	178	62
Shallow Bedrock[3]	663	204	723	233	799	213	1,123	339	816	246	1,174	376
Risk of Corrosion (Concrete)	613	169	1,093	273	1,306	332	595	152	489	117	635	164
Risk of Corrosion (Steel)	2,347	723	3,263	914	3,283	836	2,460	722	2,352	694	2,473	776
Shallow Excavation Limitations	1,368	442	2,504	698	2,414	615	2,004	604	1,340	421	1,587	505
Small Commercial Building Limitations	1,559	499	2,878	796	2,856	731	2,206	660	1,493	465	1,775	556
Expansive Soils	592	208	706	202	600	152	489	148	526	176	609	205

[1] Limited Revegetation Potential

[2] Wet Soils

[3] Lithic Bedrock 60 inches or less from the soil surface

Source: NRCS 2011.

Note: GSM data did not have interpretations for hydric soils, shallow excavations, small commercial buildings, or prime farmland. Percentages for these interpretations exclude areas with only GSM data.

Table 3.3-11 Project Impacts to Water Erosion-Prone Soils by Watershed in Region II

General Region II		II-A		II-B		II-C		II-D		II-E		II-F		Emma Park Alternative Variation		Emma Park Alternative Variation - Comparison		Strawberry IRA Micro-siting Option 1		Strawberry IRA Micro-siting Option 1 - Comparison		Strawberry IRA Micro-siting Option 2		Strawberry IRA Micro-siting Option 2 - Comparison		Strawberry IRA Micro-siting Option 3		Strawberry IRA Micro-siting Option 3 - Comparison		Cedar Knoll IRA Micro-siting Option 1		Cedar Knoll IRA Micro-siting Option 1 - Comparison		Cedar Knoll IRA Micro-siting Option 2		Cedar Knoll IRA Micro-siting Option 2 - Comparison		Highway 191 Alternative Connector		Castle Dale Alternative Connector		Price Alternative Connector		Lynndyl Alternative Connector		IPP East Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1406000604	Agency Draw-Willow Creek							17	5			17	5																																		
1406000305	Antelope Creek							5	1	16	4	5	1																																		
1406000402	Avintaquin Creek											5	2			5	2																														
1406000705	Beaver Creek-Price River							13	5	44	11	13	5	24	9	13	5																														
1403000101	Bitter Creek			50	12	50	12																																								
1405000709	Bitter Creek			0	0	0	0																																								
1603000514	Chalk Creek					11	3																																								
1403000106	Cisco Wash			15	4	15	4																																								
1406000102	Cliff Creek	39	13					21	6	21	6	21	6																																		
1406000708	Coal Creek-Price River			10	2			0	0					0	0																											1	0				
1403000104	Cottonwood Canyon			13	3	13	3																																								
1406000902	Cottonwood Creek			66	26	51	14																																	2	1						
1406000310	Cottonwood Creek-Dry Gulch Creek	4	1							4	1																																				
1406000710	Cottonwood Wash-Price River			0	0																																										
1405000711	Cottonwood Wash-White River							12	3	10	3	12	3																																		
1405000710	Coyote Wash							97	23	57	13	97	23																																		
1406000404	Currant Creek	8	3															8	3	8	3	8	3	8	3	8	3	8	3																		
1406000707	Desert Seep Wash			70	14																																					8	2				
1602020203	Diamond Fork	0	0															0	0	0	0	0	0	0	0	0	0	0	0																		
1405000705	Dripping Rock Creek-White River	14	3					14	3	14	3	14	3																																		
1406000309	Dry Gulch Creek	0	0							0	0							0	0	0	0	0	0	0	0	0	0	0	0																		
1406000315	Duchesne River									1	0																																				
1405000706	Evacuation Creek			1	0	1	0																																								
1406000903	Ferron Creek					56	16																																								

Table 3.3-11 Project Impacts to Water Erosion-Prone Soils by Watershed in Region II

General Region II		II-A		II-B		II-C		II-D		II-E		II-F		Emma Park Alternative Variation		Emma Park Alternative Variation - Comparison		Strawberry IRA Micro-siting Option 1		Strawberry IRA Micro-siting Option 1 - Comparison		Strawberry IRA Micro-siting Option 2		Strawberry IRA Micro-siting Option 2 - Comparison		Strawberry IRA Micro-siting Option 3		Strawberry IRA Micro-siting Option 3 - Comparison		Cedar Knoll IRA Micro-siting Option 1		Cedar Knoll IRA Micro-siting Option 1 - Comparison		Cedar Knoll IRA Micro-siting Option 2		Cedar Knoll IRA Micro-siting Option 2 - Comparison		Highway 191 Alternative Connector		Castle Dale Alternative Connector		Price Alternative Connector		Lynndyl Alternative Connector		IPP East Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1406000704	Gordon Creek							3	1																																	12	4				
1406000709	Grassy Trail Creek			15	3																																										
1407000202	Headwaters Muddy Creek					16	5																																								
1406000901	Huntington Creek			44	16	35	7	14	5																															71	19						
1406000407	Indian Canyon									0	0	0	0			0	0																														
1407000201	Ivie Creek					61	17																																								
1603000501	Ivie Creek					5	1																																					0	0		
1406000803	Little Grand Wash			42	12	42	12																																								
1406000711	Little Park Wash-Price River			45	9	35	7																																								
1603000305	Lost Creek-Sevier River					33	9																																								
1406000801	Lost Spring Wash-Saleratus Wash			6	2	42	9																																								
1406000504	Lower Ninemile Creek							5	3			5	3																																		
1406000408	Lower Strawberry River	12	4															12	4	12	4	12	4	12	4	12	4	12	4																		
1401000519	McDonald Creek-Colorado River			10	3	10	3																																								
1603000512	Middle Sevier River			12	4	0	0					12	4																																		
1406000403	Middle Strawberry River	35	12															37	12	35	12	38	13	35	12	38	13	35	12																		
1406000706	Miller Creek																																									0	0				
1406000904	North Salt Wash					35	10																																								
1406000106	Pelican Lake-Green River	10	2							10	2																																				
1406000308	Pigeon Water Creek-Lake Fork River	18	7							5	1							18	7	18	7	18	7	18	7	18	7	18	7																		
1406000406	Rabbit Gulch	25	9															26	9	25	9	26	9	25	9	25	9	25	9																		
1406000405	Red Creek	25	8															25	8	25	8	25	8	25	8	25	8	25	8																		
1405000704	Red Wash-White River	23	6	1	0	1	0	23	6	23	6	23	6																																		

Table 3.3-11 Project Impacts to Water Erosion-Prone Soils by Watershed in Region II

General Region II		II-A		II-B		II-C		II-D		II-E		II-F		Emma Park Alternative Variation		Emma Park Alternative Variation - Comparison		Strawberry IRA Micro-siting Option 1		Strawberry IRA Micro-siting Option 1 - Comparison		Strawberry IRA Micro-siting Option 2		Strawberry IRA Micro-siting Option 2 - Comparison		Strawberry IRA Micro-siting Option 3		Strawberry IRA Micro-siting Option 3 - Comparison		Cedar Knoll IRA Micro-siting Option 1		Cedar Knoll IRA Micro-siting Option 1 - Comparison		Cedar Knoll IRA Micro-siting Option 2		Cedar Knoll IRA Micro-siting Option 2 - Comparison		Highway 191 Alternative Connector		Castle Dale Alternative Connector		Price Alternative Connector		Lynndyl Alternative Connector		IPP East Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1403000107	Sagers Wash			71	18	71	18																																								
1603000304	Salina Creek					102	29																																								
1403000501	Salt Wash			8	2	8	2																																								
1406000804	Salt Wash-Green River			30	8	30	8																																								
1406000702	Scofield Reservoir							28	10	2	1																																				
1406000505	Sheep Wash-Green River							20	5			20	5																																		
1603000401	Silver Creek	0	0	4	1			40	13	0	0	0	0																																		
1602020201	Soldier Creek	48	20							65	28	65	28					6	2	7	2	6	2	7	2	6	2	7	2	41	18	41	18	41	18	41	18										
1406000304	Strawberry River-Duchesne River	20	7							28	7							20	7	20	7	20	7	20	7	20	7	20	7																		
1406000805	Tenmile Canyon			11	3	11	3																																								
1602020202	Thistle Creek	72	35					1	1	72	35	72	35																	63	33	72	35	60	33	72	35										
1406000802	Tusher Wash-Green River			1	0	1	0																																								
1406000314	Uinta River	0	0							0	0																																				
1406000503	Upper Ninemile Creek							63	18	21	5	96	30	8	3	40	15																														
1406000501	Upper Pariette Draw							0	0			0	0																																		
1603000402	Upper San Pitch River			62	24			73	29																																						
1406000905	Upper San Rafael River					37	8																																								
1603000504	Upper Sevier River			0	0							0	0																														1	0			
1406000401	Upper Strawberry River	14	4															12	3	14	4	11	3	14	4	11	3	14	4																		
1406000105	Walker Hollow-Green River	80	32					10	2	36	10	10	2																																		
1602020101	West Creek	30	14	0	0			16	9	30	14	30	14																	16	7	17	7	16	7	17	7										
1401000517	West Salt Creek			80	22	80	22																																								
1403000102	Westwater Creek			38	10	38	10																																								
1403000108	Westwater Creek-Colorado River			33	9	33	9																																								

Table 3.3-11 Project Impacts to Water Erosion-Prone Soils by Watershed in Region II

General Region II		II-A		II-B		II-C		II-D		II-E		II-F		Emma Park Alternative Variation		Emma Park Alternative Variation - Comparison		Strawberry IRA Micro-siting Option 1		Strawberry IRA Micro-siting Option 1 - Comparison		Strawberry IRA Micro-siting Option 2		Strawberry IRA Micro-siting Option 2 - Comparison		Strawberry IRA Micro-siting Option 3		Strawberry IRA Micro-siting Option 3 - Comparison		Cedar Knoll IRA Micro-siting Option 1		Cedar Knoll IRA Micro-siting Option 1 - Comparison		Cedar Knoll IRA Micro-siting Option 2		Cedar Knoll IRA Micro-siting Option 2 - Comparison		Highway 191 Alternative Connector		Castle Dale Alternative Connector		Price Alternative Connector		Lynndyl Alternative Connector		IPP East Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1406000701	White River									38	10	25	6	22	7	15	4																														
1406000703	Willow Creek							17	7	11	3	26	10	13	5	26	10																					9	3								
1405000701	Wolf Creek	3	1	6	1	6	1	3	1	3	1	3	1																																		

[1] Discrepancies in totals due to rounding.

Note: Blanks denote no impacts.

Sources: NRCS 2011; NRCS et al. 2010.

Alternative II-A (Applicant Proposed)

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 65 percent of Alternative II-A. The remaining 35 percent was analyzed using U.S. GSM data. The primary constraints for Alternative II-A during construction would be disturbance of 1,092 acres of soils with limited revegetation potential and 1,214 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (2,347 acres); however, the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion. Soil limitations within the analysis area related to shallow excavations include cutback caving, flooding, large stones, slope, and a cemented pan within the soil profile.

Along Alternative II-A are three micro-siting alternatives, Strawberry IRA Options 1, 2, and 3. For the Strawberry IRA micro-siting option, the soils located along Option 1, 2, and 3 have similar soil limitations to the soils located along Alternative II-A.

Alternative II-B

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 88 percent of Alternative II-B. The remaining 12 percent was analyzed using U.S. GSM data. The primary constraints for Alternative II-B during construction would be disturbance of 1,921 acres of soils with limited revegetation potential and 2,013 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (3,263 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative II-C

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 87 percent of Alternative II-C. The remaining 13 percent was analyzed using U.S. GSM data. The primary constraints for Alternative II-C during construction would be disturbance of 2,351 acres of soils with limited revegetation potential and 1,929 acres of compaction prone soils. Additionally Alternative II-C would cross Mancos shale outcrops near Rangely. Any soils derived from Mancos shale would be saline and difficult to reclaim. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (3,283 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative II-D

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 82 percent of Alternative II-D. The remaining 18 percent was analyzed using U.S. GSM data. The primary constraints for Alternative II-D during construction would be disturbance of 1,081 acres of soils with limited revegetation potential and 1,317 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (2,460 acres); however the

effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion. Soil limitations within the analysis area related to shallow excavations include cutback caving, flooding, large stones, slope, and a cemented pan within the soil profile.

Alternative II-E

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 63 percent of Alternative II-E. The remaining 37 percent was analyzed using U.S. GSM data. The primary constraints for Alternative II-E during construction would be disturbance of 1,045 acres of soils with limited revegetation potential and 1,137 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (2,352 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion. Soil limitations within the analysis area related to shallow excavations include cutback caving, flooding, large stones, slope, and a cemented pan within the soil profile.

Along Alternative II-E are two sets of microsite alternatives, Strawberry IRA Option 1, 2, and 3 and Cedar Knoll IRA Option 1, and 2. For the Strawberry IRA Option microsites, the soils located along Option 1, 2, and 3 have fewer soil limitations than the soils located along Alternative II-E. The Cedar Knoll IRA Option 1 and 2 also have fewer soil limitations than soils along Alternative II-E.

Alternative II-F (Agency Preferred)

Detailed SSURGO data were analyzed on approximately 65 percent of Alternative II-F. The remaining 35 percent was analyzed using U.S. GSM data. Alternative II-F would impact the highest acreage of soils with constraints and limitations. The primary constraints for Alternative II-F during construction would be disturbance of 1,247 acres of soils with limited revegetation potential and 1,361 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (2,473 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion. Soil limitations within the analysis area related to shallow excavations include cutback caving, flooding, large stones, slope, and a cemented pan within the soil profile.

Along Alternative II-F are micro-siting options, Cedar Knoll IRA options 1 and 2. The Cedar Knoll IRA options 1 and 2 have fewer soil limitations than soils along Alternative II-F.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation would impact more water erodible, compaction prone, prime farmland, soils with shallow bedrock, and soils with severe limitations related to shallow excavations and small commercial buildings than Alternative II-F. The Emma Park Alternative Variation would impact fewer LRP soils and expansive soils.

Alternative Connectors in Region II

Table 3.3-12 summarizes the characteristics of soils that would be impacted by the various connectors and impacts and advantages associated with the alternative connectors in Region II.

Table 3.3-12 Summary of Region II Alternative Connector Impacts for Soils

Alternative Connector	Analysis	Advantage
Highway 191 Alternative Connector	Approximately 27 acres of LRP, 4 acres of expansive soils, 18 acres of compaction prone soils, 54 acres of soils shallow to bedrock, and 68 acres soils corrosive to steel, would be impacted during construction.	This connector would link Alternative II-F to the Alternative II-E route or to the Emma Park Alternative Variation. This would reduce impacts to soils with shallow bedrock and may help to reduce impacts to soils prone to slumping or landslides.
Castle Dale Alternative Connector	Approximately 59 acres water erodible soils, 144 acres of LRP, 31 acres of expansive soils, 114 acres of compaction prone soils, 140 acres soils corrosive to steel, and 14 acres of prime farmland would be impacted during construction.	This connector would link the Alternative II-C route to Alternatives II-A, II-B, or II-D, which would result in less acreage of surface disturbance to soils.
Price Alternative Connector	Approximately 4 acres of water erodible soils, 59 acres of LRP soils, 175 acres of soils corrosive to steel, 67 acres of prime farmland, and 44 acres of shallow soils would be impacted. No wind erodible soils would be impacted.	This connector would link the Alternative II-B route to Alternative II-D, which would result in less acreage of surface disturbance to soils.
Lynndyl Alternative Connector (Alternatives II-B and II-C)	Approximately 48 acres of prime farmland, 157 acres of soils with a shallow depth to bedrock, 38 acres of LRP, and 42 acres of compaction prone soils would be impacted if this alternative connector were used. No wind erodible or water erodible soils would be impacted	Less prime farmland, LRP, and wind erodible soils are located on the Alternative II-B route compared to the Alternative II-C route. The connecter would help reduce impacts to the soils on Alterative II-C if the alternate connector was utilized.
IPP East Alternative Connector (Alternatives II-A and II-B)	Approximately 28 acres of wind erodible soils, 30 acres of LRP, and 31 acres of soils corrosive to steel and 30 acres of soils corrosive to concrete would be impacted. No water erodible soils, shallow soils, or prime farmland would be impacted.	Less hydric and LRP soils occur on the Alternative II-B route compared to the Alternative II-A route. The connecter would allow for avoidance of sensitive soils associated with Alternative II-A.

Region II Conclusion

As presented in **Table 3.3-10**, Alternative II-C would have the greatest impact on soil resources. Alternative II-C would impact more water erodible soils, LRP soils, hydric soils, prime farmland soils, and soils corrosive to concrete and steel than the other alternatives. Alternative II-B would impact more compaction prone soils, soils prone to shrink-swell, and soils with severe limitations for shallow excavations than the other alternatives. In general, Alternative II-A and II-E would have the least overall impact on soil resources.

3.3.6.5 Region III

Region III would have impacts similar to those discussed in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components.

Portions of Region III are comprised soils derived from the Green River Formation (lake sediments with interbedded limestone, sandstone, mudstone, saline evaporate deposits, siltstone and dolomite). These soils have a carbonaceous mineralogy (> 40 percent $CaCO_3$ in the subsoil horizons and substratum layers) and are strongly alkaline. These soils would have limited revegetation potentials, especially on south and west aspects and may require seed mixes that include species adapted to the chemical characteristics of the soils.

Alternative III-A crosses an inventoried roadless area on the Dixie NF. IRAs may contain important environmental values that warrant protection and are, as a general rule, managed to preserve their roadless characteristics. The 250-foot-wide transmission line ROW would create a linear disturbance in an otherwise undisturbed landscape, which could create access routes for trespass. Indirect effects that could occur due to trespass include soil compaction and increased erosion.

As stated in Section 3.3.6.4, losses of biological soils crusts would be expected where surface disturbance occurs. Similar impacts to soils would be expected in Region III from loss of surface crusts.

Region III would have impacts similar to those discussed in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components. In locations where operations or maintenance activities disturb or remove the protective soil cover (vegetation and vegetative litter) on droughty, saline, or strongly alkaline soils, these soils would be highly erodible and difficult to revegetate.

Table 3.3-13 provides a summary of the data sources used for analysis in Region III. As stated in Section 3.3.2, detailed order 3 SSURGO soil survey data were utilized where available; all other areas were characterized using U.S. **Table 3.3-14** provides a comparison of impacts associated with the construction and operation of alternative routes in Region III. **Table 3.3-15** provides details of water erosion-prone soils impacted by construction and operation by watershed (HUC10; NRCS et al. 2010).

Table 3.3-13 Region III Data Sources Used for Analysis

Alternatives	Miles			Percentage	
	SSURGO	GSM	Total Miles[1]	SSURGO	GSM
Alternative III-A	195	81	276	71	29
Alternative III-B	222	63	285	78	22
Alternative III-C	258	50	308	84	16
Connectors					
Avon	8	0	8	100	0
Moapa	13	0	13	100	0

Table 3.3-13 Region III Data Sources Used for Analysis

Alternatives	Miles			Percentage	
	SSURGO	GSM	Total Miles[1]	SSURGO	GSM
Variations					
Ox Valley East	0	16	16	0	100
Ox Valley East Comparable	0	15	15	0	100
Ox Valley West	<1	16	17	3	97
Ox Valley West Comparable	0	15	15	0	100
Pinto	8	22	29	26	74
Pinto Comparable	8	15	24	36	64

[1] Discrepancies in totals due to rounding.

Table 3.3-14 Summary of Impacts to Soils by Alternatives in Region III

Parameter	Alternative III-A		Alternative III-B		Alternative III-C	
	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
Water Erosion-Prone	77	24	36	11	62	15
Wind Erosion-Prone	114	30	140	32	105	25
Compaction-Prone	864	232	1,106	269	1,039	250
LRP[1]	1,586	392	1,453	338	1,579	382
Hydric[2]	47	12	33	8	52	13
Prime Farmland	132	31	113	28	286	70
Shallow Bedrock[3]	1,073	331	871	226	759	188
Risk of Corrosion (Concrete)	650	155	669	150	660	154
Risk of Corrosion (Steel)	2,799	740	2,665	644	2,926	708
Shallow Excavation Limitations	1,604	449	1,662	421	1,964	479
Small Commercial Building Limitations	1,486	418	1,568	398	1,906	470
Expansive Soils	141	37	222	56	221	54

[1] Limited Revegetation Potential.

[2] Wet Soils.

[3] Lithic Bedrock 60 inches or less from the soil surface.

Source: NRCS 2011.

Note: GSM data did not have interpretations for hydric soils, shallow excavations, small commercial buildings, or prime farmland. Percentages for these interpretations exclude areas with only GSM data.

Alternative III-A (Applicant Proposed)

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 71 percent of Alternative III-A. The remaining 29 percent was analyzed using U.S. GSM data. The primary constraints for Alternative III-A during construction would be disturbance of 1,586 acres of soils with limited revegetation potential and 864 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (2,799 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative III-B (Agency Preferred)

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 78 percent of Alternative III-B. The remaining 22 percent was analyzed using U.S. GSM data. The primary constraints for Alternative III-B during construction would be disturbance of 1,453 acres of soils with limited revegetation potential and 1,106 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (2,665 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative III-C

Key Parameters Summary

Detailed SSURGO data were analyzed on approximately 84 percent of Alternative III-C. The remaining 16 percent was analyzed using U.S. GSM data. The primary constraints for Alternative III-C during construction would be disturbance of 1,579 acres of soils with limited revegetation potential and 1,039 acres of compaction prone soils. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (2,926 acres); however the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative Variations in Region III

Table 3.3-16 provides a comparison of impacts associated with the alternative variations in Region III.

Alternative Connectors in Region III

Table 3.3-17 summarizes the characteristics of soils that would be impacted by the various connectors and impacts and advantages associated with the alternative connectors in Region III.

Alternative Ground Electrode System Locations in Region III

Table 3.3-18 summarizes impacts associated with Ground Electrode Systems connectors in Region III.

Table 3.3-15 Project Impacts to Water Erosion-Prone Soils by Watershed in Region III

General Region III		III-A		III-B		III-C		Ox Valley East Alternative Variation		Ox Valley East Alternative Variation - Comparison		Ox Valley West Alternative Variation		Ox Valley West Alternative Variation - Comparison		Pinto Alternative Variation		Pinto Alternative Variation - Comparison		Avon Alternative Connector		Moapa Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1501001207	California Wash	24	8	14	4																	1	0
1501001306	Cathedral Gorge-Meadow Valley Wash					45	11																
1501001305	Clover Creek			2	1	1	0																
1501001206	Dry Lake Valley	0	0	5	1	20	5															1	0
1606000909	Dry Lake Valley					1	0																
1501001204	Elbow Canyon					2	1																
1603000610	Gold Springs Wash			2	1	2	0																
1501000512	Government Wash-Colorado River	5	2	5	2	5	1																
1501001007	Halfway Wash-Virgin River	1	0	1	0																		
1501001307	Kershaw Canyon-Meadow Valley Wash					2	1																
1603000703	Long Lick Canyon-Big Wash	0	0	0	0	0	0																
1501001309	Lower Meadow Valley Wash			0	0																		
1501001209	Lower Muddy River	44	13	2	0																		
1501000808	Lower Santa Clara River	7	2																				
1501001203	Middle Pahranagat Wash					0	0																
1501000806	Moody Wash							1	0			1	0										
1501001504	Nellis Air Force Base					5	1																

Table 3.3-15 Project Impacts to Water Erosion-Prone Soils by Watershed in Region III

General Region III		III-A		III-B		III-C		Ox Valley East Alternative Variation		Ox Valley East Alternative Variation - Comparison		Ox Valley West Alternative Variation		Ox Valley West Alternative Variation - Comparison		Pinto Alternative Variation		Pinto Alternative Variation - Comparison		Avon Alternative Connector		Moapa Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1501001006	Sand Hollow Wash-Virgin River	0	0																				
1603000613	Shoal Creek	6	1					15	6			18	6					6	1				
1603000706	The Big Wash-Beaver River	0	0	0	0	0	0																
1501001005	Toquop Wash	18	7	17	6																		
1501001208	Upper Muddy River	3	1	0	0																		

Note: Blanks denote no impacts.

Source: NRCS 2011; NRCS et al. 2010.

Table 3.3-16 Summary of Region III Alternative Variation Impacts for Soils

Alternative Variation	Analysis
Ox Valley East Alternative Variation	This route would impact more LRP, compaction prone, shallow soils, and soils with severe limitations for risk of corrosion to concrete compared to the comparable Alternative III-A segments.
Ox Valley West Alternative Variation	This route would impact more LRP, compaction prone, shallow soils, and soils with severe limitations for risk of corrosion to concrete compared to the comparable Alternative III-A segments.
Pinto Alternative Variation	This route would impact more LRP, compaction prone, shallow soils, and soils with severe limitations for risk of corrosion to concrete compared to the comparable Alternative III-A segments.

Table 3.3-17 Summary of Region III Alternative Connector Impacts for Soils

Alternative Connector	Analysis	Advantage
Avon Alternative Connector	Approximately 5 acres of wind erodible, 83 acres of LRP, 53 acres of expansive soils, and 60 acres of compaction prone soils would be impacted if this alternative connector were used. No water erodible soils would be impacted.	This connector would result in a reduction of impacts to prime farmland soils associated with the Alternative III-C route and a reduction in overall surface disturbance to soils that would result from Alternative III-C.
Moapa Alternative Connector	Approximately 27 acres of wind erodible, 29 acres of soils with shallow bedrock, 65 acres of LRP, and 8 acres of compaction prone soils would be impacted if this alternative connector were used.	This connector route would result in a small reduction of the acreage of soil resources impacted by Alternative III-C, if used to cross over to Alternatives III-A or III-B.

Table 3.3-18 Summary of Region III Alternative Ground Electrode System Impacts (Acres)[1]

	Wind Erodible	Water Erodible	Compaction Prone	LRP	Hydric	Prime Farmland	Shallow Bedrock	Risk of Corrosion - Concrete	Risk of Corrosion - Steel	Shallow Excavations	Expansive Soils
Halfway Wash- Virgin River (Alternative III-A)	34	30	34	73	0	0	485	73	596	561	34
Halfway Wash- Virgin River (Alternative III-B)	34	30	34	73	0	0	485	73	596	561	34
Halfway Wash East (Alternative III-A)	30	0	0	0	0	0	570	0	600	570	0
Halfway Wash East (Alternative III-B)	30	0	0	0	0	0	570	0	600	570	0
Meadow Valley 2 (Alternative III-C)	14	0	0	0	0	0	269	0	283	269	0
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	29	0	13	13	13	0	558	13	600	571	13
Mormon Mesa- Carp Elgin Rd (Alternative III-B)	29	0	13	13	13	0	558	13	600	571	13
Delta Ground Electrode Bed (DO2)	0	0	198	575	0	0	0	321	575	0	0

[1] Limited Revegetation Potential

[2] Wet Soils

[3] Lithic Bedrock 60 inches or less from the soil surface.

Note: Acreages are based on 600-acre siting areas, but much smaller areas within the siting areas would be required for the facilities as shown in Chapter 2.0, **Table 2-17**.

Region III Conclusion

As presented in **Table 3.3-14**, Alternative III-B would have the greatest impact on compaction prone soils, soils prone to expansion, and wind erodible soils than the other alternatives. Alternative III-A, would impact more acres of LRP soils, soils with shallow bedrock, and soils prone to water erosion. Alternative III-C would impact more acres of hydric soils, prime farmland, soils corrosive to steel, and soils with severe limitations for shallow excavations. While all alternative have their limitations, in general, Alternative III-C would have the highest overall impact on soil resources.

3.3.6.6 Region IV

Region IV would have impacts similar to what is described for the construction impacts discussed in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components.

As stated in Section 3.3.6.4, losses of biological soils crusts would be expected where surface disturbance occurs. Similar impacts to soils would be expected in Region III from loss of surface crusts.

The operation impacts in Region IV would be similar to those discussed in Section 3.3.6.2, Impacts Common to all Alternative Routes and Associated Components. In locations where operations or maintenance activities disturb or remove the protective soil cover (vegetation and vegetative litter) on droughty, saline, or strongly alkaline soils, these soils would highly erodible and difficult to revegetate.

Table 3.3-19 provides a summary of the data sources used for analysis in Region IV. Detailed order 3 SSURGO soil survey data were available for all alternatives within Region IV; therefore, no GSM data were utilized. **Table 3.3-20** provides a comparison of impacts associated with the construction and operation of alternative routes in Region IV. **Table 3.3-21** provides details of water erosion-prone soils impacted by construction and operation by watershed (HUC10; NRCS et al. 2010).

Table 3.3-19 Region IV Data Sources Used for Analysis

Alternatives	Miles		Total Miles	Percentage	
	SSURGO	GSM		SSURGO	GSM
Alternative IV-A	37	0	37	100	0
Alternative IV-B	39	0	39	100	0
Alternative IV-C	44	0	44	100	0
Connectors					
Sunrise Mountain	3	0	3	100	0
Lake Las Vegas	4	0	4	100	0
Three Kids Mine	5	0	5	100	0
River Mountain	7	0	7	100	0
Railroad Pass	3	0	3	100	0
Variations					
Marketplace	8	0	8	100	0
Marketplace Comparable	7	0	7	100	0

Table 3.3-20 Summary of Impacts to Soils by Alternatives in Region IV

Parameter	Alternative IV-A		Alternative IV-B		Alternative IV-C	
	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
Water Erosion-Prone	16	3	1	0	1	0
Wind Erosion-Prone	1	0	66	20	109	29
Compaction-Prone	0	0	3	1	2	1
LRP[1]	191	48	191	59	166	48
Hydric[2]	0	0	3	1	2	1
Prime Farmland	0	0	0	0	0	0
Shallow Bedrock[3]	153	42	109	41	116	38
Risk of Corrosion (Concrete)	105	23	138	38	124	30
Risk of Corrosion (Steel)	371	97	449	135	519	140
Shallow Excavation Limitations	439	116	465	141	545	144
Small Commercial Building Limitations	439	116	462	140	524	139
Expansive Soils	0	0	3	1	2	1

[1] Limited Revegetation Potential

[2] Wet Soils

[3] Lithic Bedrock 60 inches or less from the soil surface

Source: NRCS 2011

Note: GSM data did not have interpretations for hydric soils, shallow excavations, small commercial buildings, or prime farmland. Percentages for these interpretations exclude areas with only GSM data.

Table 3.3-21 Project Impacts to Water Erosion-Prone Soils by Watershed in Region IV

General Region IV		IV-A		IV-B		IV-C		Marketplace Alternative Variation		Marketplace Alternative Variation - Comparison		Sunrise Mountain Alternative Connector		Lake Las Vegas Alternative Connector		Three Kids Mine Alternative Connector		River Mountain Alternative Connector		Railroad Pass Alternative Connector	
HUC10	Watershed	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)	Const. (acres)	Operat. (acres)
1501001507	Duck Creek-Las Vegas Wash	0	0	0	0	0	0							2	1	1	0				
1606001518	Eldorado Valley					0	0														
1501000512	Government Wash-Colorado River	36	9	21	6	21	6					3	1	1	0	2	1				
1501000513	Gypsum Wash-Colorado River					0	0														
1503010101	Jumbo Wash-Colorado River					1	0														

Note: Blanks denote no impacts.

Source: NRCS 2011; NRCS et al. 2010.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Key Parameters Summary

Detailed SSURGO data were analyzed on 100 percent of Alternative IV-A. The primary soil constraint for Alternative IV-A during construction would be disturbance of 191 acres of soils with limited revegetation potential and 153 acres of soils that have shallow bedrock present. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (371 acres); however, the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative IV-B

Key Parameters Summary

Detailed SSURGO data were analyzed on 100 percent of Alternative IV-B. The primary soil constraint for Alternative IV-B during construction would be disturbance of 191 acres of soils with limited revegetation potential and 109 acres of soils that have shallow bedrock present. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (449 acres); however, the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative IV-C

Key Parameters Summary

Detailed SSURGO data were analyzed on 100 percent of Alternative IV-C. The primary constraint for Alternative IV-C during construction would be disturbance of 166 acres of soils with limited revegetation potential and 116 acres of soils that have shallow bedrock present. Mitigation measures **S-1**, **S-2**, **S-3**, **S-5**, **S-9**, **S-13**, and **VG-1** would help to reduce impacts on these soils and increase the potential for revegetation. Soils with limitations associated with the risk of corrosion to steel are prevalent along this route (519 acres); however, the effects of corrosion on steel structures would be offset by the use of protective coating and cathodic protection. No substantive effect is expected related to corrosion.

Alternative Variations in Region IV

Table 3.3-22 provides a summary of impacts associated with the alternative variation in Region IV.

Table 3.3-22 Summary of Region IV Alternative Variation Impacts for Soils

Alternative Variation	Analysis
Marketplace Alternative Variation (Alternative IV-B)	This alternative variation would impact less wind erodible soils and soils with severe limitations for risk of corrosion to concrete than the proposed segments it would replace. This alternative would impact more LRP soils and soils with severe limitations for shallow excavations and small commercial buildings than the comparable Alternative IV-B segments.

Alternative Connectors in Region IV

Table 3.3-23 summarizes the characteristics of soils that would be impacted by the various connectors and impacts and advantages associated with the alternative connectors in Region IV.

Table 3.3-23 Summary of Region IV Alternative Connector Impacts for Soils

Alternative Connector	Analysis	Advantage
Sunrise Mountain Alternative Connector	Approximately 3 acres of water erodible, 20 acres of LRP, and 13 acres of shallow soils would be impacted by this alternative. No compaction prone soils would be impacted by this alternative.	This connector route would result in a reduction of the acreage of LRP and shallow soils impacted by Alternative IV-A, if used to cross over to Alternatives IV-B or IV-C.
Lake Las Vegas Alternative Connector	Approximately 4 acres of wind erodible, 4 acres of water erodible, 18 acres of LRP, and 17 acres of shallow soils would be impacted by this alternative. No compaction prone soils would be impacted by this alternative.	This connector route would result in a reduction of the acreage of soils impacted within the Lake Mead National Recreation Area impacted by Alternatives IV-B or IV-C, if used to cross over to the proposed route.
Three Kids Mine Alternative Connector	Approximately 4 acres of wind erodible, 3 acres of water erodible, 38 acres of LRP, and 46 acres of shallow soils would be impacted by this alternative. No compaction prone soils would be impacted by this alternative.	This connector route would result in a reduction of the acreage of soils impacted within the Lake Mead National Recreation Area impacted by Alternatives IV-B or IV-C, if used to cross over to the proposed route.
River Mountains Alternative Connector	Approximately 12 acres of wind erodible, 39 acres of LRP, and 64 acres of shallow soils would be impacted by this alternative. No compaction prone soils or water erodible soils would be impacted by this alternative.	This connector route would result in a reduction of the acreage of sensitive soils impacted by Alternatives IV-B or IV-C, if used to cross over to the proposed route.
Railroad Pass Alternative Connector (Alternatives IV-A and IV-B)	Approximately 4 acres of LRP and 19 acres of shallow soils would be impacted by this alternative. No compaction prone, wind, or water erodible soils would be impacted by this alternative.	This connector route would reduce the acres of LRP and shallow bedrock soils impacted by Alternative IV-A, if used to cross to the Alternative IV-B route.

Region IV Conclusion

As presented in **Table 3.3-20**, Alternative IV-B and Alternative IV-C would have the greatest impact on soil resources. Alternative IV-B would impact more soils corrosive to concrete, soils prone to shrink-swell, and LRP soils. Alternative IV-C would impact more soils corrosive to steel, and soils with severe limitations for shallow excavations. In general, Alternative IV-A would have the least overall impact on soil resources.

3.3.6.7 Residual Impacts

Mitigation measures are designed to reduce impacts to soil resources but do not fully mitigate the impacts. All of the alternatives would result in site specific losses to long-term soil quality and productivity due to accelerated erosion and soil mixing. Because soil formation of topsoil is a slow process, it can take decades for topsoil to recover in the arid west and for soil productivity to improve.

3.3.6.8 Impacts to Soils from the No Action Alternative

Under the No Action Alternative, the proposed project would not be authorized and would not be developed. Associated impacts to soils from construction and maintenance would not occur. Natural and anthropogenic actions such as erosion, agriculture, fire, recreation, and grazing would continue to impact soil resources at present levels in the analysis area.

3.3.6.9 Irreversible and Irretrievable Commitment of Resources

An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time. An irreversible commitment of a resource is one in which the resource use is lost permanently or indefinitely. If the transmission line is left in operation on a permanent basis or concrete foundations are left in place during decommissioning an irreversible loss of soil productivity and quality would be lost associated with structure foundations, regeneration sites, substations, terminals, and support facilities. Alternately, an irretrievable commitment of soil resources during the life span of the transmission line would be anticipated until all concrete foundations are removed and successful reclamation is achieved.

3.3.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

Overall site productivity is primarily a matter of revegetation success. Productivity varies with vegetation community, but more importantly, with land management objectives as they relate to the establishment of desirable or productive vegetation types. In contrast, soil quality is an inherent soil resource characteristic involving aeration, permeability, texture, salinity and alkalinity, microbial populations, fertility, and other physical and chemical characteristics that are accepted as beneficial to overall plant growth and establishment. Based on this concept, there would be impacts to short-term uses and long-term productivity related to the quality of native soils after project-related disturbance. However, long-term soil productivity can be restored once successful revegetation is completed.

3.4 Water Resources

3.4.1 Regulatory Background

The CWA, originally the Federal Water Pollution Control Act of 1948 (with major amendments in 1972 and 1977), is the framework that regulates water quality standards and pollutant discharges into WUS. Sections 303d and 305b of the CWA require that water quality of streams, rivers, and lakes are assessed on a regular basis; that waters found to be in violation of water quality standards are listed as impaired; and that priorities are set for actions to improve water quality. Section 402 of the CWA created the National Pollutant Discharge Elimination System (NPDES), which is administered by most individual states and includes stormwater permits and requirements for construction areas. Section 404 of the CWA regulates dredging and filling of WUS, and permits for such activities are issued by the USACE.

The Colorado River Basin's water quality also is administered under the Colorado River Basin Salinity Control Act, which is enacted through a forum. The purposes of the forum are to coordinate salinity control efforts among the states, to coordinate with federal agencies on the implementation of the Colorado River Basin Salinity Control Program, to work with Congress on the authorization and funding of the program, to act to disseminate information on salinity control, and to otherwise promote efforts to reduce the salt loading to the Colorado River (Colorado River Basin Salinity Control Forum 2012).

Water use is administered by individual states in some form of the prior appropriation doctrine under the following state statutes:

- Wyoming – Title 41, Wyoming Statutes Annotated, 1977
- Colorado – State Constitution Article XVI sections 5 and 6
- Utah – Utah Code, Title 73
- Nevada – Nevada Revised Statutes, Chapters 532 through 538

3.4.2 Data Sources

The Watershed Boundary Dataset (WBD) is a GIS-based dataset of seamless drainage boundaries for the U.S. (NRCS et al. 2010). The drainages are described as a multi-level or ordered, hierarchal system consisting of hydrographic regions, subregions, basins, subbasins, watersheds, and subwatersheds. There are 21 regions across the U.S., including Hawaii, Alaska, and Puerto Rico/US Virgin Islands. Each subsequent level is divided into smaller drainages that nest within the larger (e.g., the Upper Colorado Region has eight subregions). Drainages within each of the levels are described with a two-digit HUC; thus, hydrographic regions are identified by a two-digit HUC (HUC-2), subregions are HUC-4, basins are HUC-6, subbasins are HUC-8, watersheds are HUC-10, and subwatersheds are HUC-12.

The National Hydrography Dataset (NHD) also is a GIS-based dataset that represents the drainage network of streams, rivers, canals, lakes, and reservoirs in the U.S. (USGS 2011). This dataset is based largely on USGS topographic maps; however, updates to certain areas have occurred and will continue. The NHD is available in high- and medium-resolution. Due to the areal extent of this Project, the medium resolution was chosen, which is based on 1:100,000-scale topographic maps.

Individual states inventory water quality every 2 years and prepare an Integrated Water Quality and Impaired Waters Assessment Report (IR) as required by the CWA, sections 303(d) and 305(b). These reports contain the water quality standards and the status of all classified waters within each state, along with a listing of all waters that are impaired or threatened. The IRs referenced in this document are listed below.

- Colorado: 2012 IR, submitted to USEPA in April 2012
- Nevada: 2006 303(d) List, approval by USEPA on February 27, 2009
  2004 305(b) Report
- Utah: 2010 IR, final approval by EPA on February 10, 2012
- Wyoming: 2012 IR, final approval by EPA on May 3, 2012

3.4.3 Analysis Area

The water resources analysis area consists of all WBD-defined Watersheds (5th order, HUC-10) with Project components located within them. **Table 3.4-1** lists the hydrographic basins within which the analysis area lies, and a detailed tabulation of the watersheds is contained in Section 3.4.5, Regional Summary of Water Resources. Water resources, including perennial streams and rivers (continually flowing), intermittent streams (groundwater component with augmentation by seasonal precipitation), ephemeral streams (flowing in response to precipitation events), lakes, reservoirs, springs, and groundwater within the watersheds and downstream of Project components will be the focus of the water resource section of the EIS.

Table 3.4-1 Hydrographic Regions and Basins Crossed by the TWE Project

Hydrographic Region	Basin
North Platte	North Platte
Upper Colorado	Colorado Headwaters
	Upper Colorado-Dolores
	Upper Green
	Great Divide Closed Basin
	White-Yampa
	Lower Green
	Upper Colorado-Dirty Devil
Great Basin	Jordan
	Escalante Desert-Sevier Lake
	Central Nevada Desert Basins
Lower Colorado	Lower Colorado-Lake Mead
	Lower Colorado-Below Hoover Dam

Source: NRCS et al. 2010

3.4.4 Baseline Description

The water resources analysis area consists of 179 hydrographic watersheds within the North Platte, Great Salt Lake, Upper Colorado, and Lower Colorado River hydrographic regions as defined by the WBD (NRCS et al. 2010). The North Platte Region drains the east side of the Continental Divide and ultimately empties to the Gulf of Mexico. The Upper Colorado Region, Lower Colorado Region, and Great Basin Region all drain the western side of the Continental Divide. Both the Upper and Lower Colorado regions ultimately drain toward the Gulf of California (excepting the Great Divide Closed Basin in south-central Wyoming), while the Great Basin Region is a closed drainage that never reaches an ocean but instead generally drains toward the Great Salt Lake.

Groundwater resources in the analysis area have been characterized by Whitehead (1996), Robson and Banta (1995), and Planert and Williams (1995). These authors report that the major aquifer systems in the analysis area are the Upper Colorado or Colorado Plateaus aquifers, and the Basin and Range aquifers.

Surficial aquifers are present in the floodplains of major surface water features and in the low-lying areas of the Basin and Range area (Whitehead 1996; Robson and Banta 1995; Planert and Williams 1995). There are no sole-source aquifers within the analysis area (USEPA 2012). Springs and seeps are found throughout the analysis area.

3.4.5 Regional Summary

The 179 watersheds (HUC-10) within the analysis area are listed in **Table 3.4-2** and depicted in **Figures 3.4-1** through **3.4-4** by region. The major rivers within each Project Region are listed in **Table 3.4-3**. **Appendix F** contains a detailed listing of waterbodies crossed by Project alternative reference lines.

Table 3.4-2 Watersheds Crossed by the TWE Project

General Project Region	Basin	Watershed	HUC-10[1]	Figure Code[2]
I	North Platte	North Platte River-Iron Springs Draw	1018000210	01
		Sugar Creek	1018000213	04
I	Upper Green	Bitter Creek-Antelope Creek	1404010501	01
		Shell Creek	1404010902	08
I	Great Divide Closed Basin	Latham Draw	1404020004	01
		Upper Separation Creek	1404020013	04
		Mud Springs Lake	1404020003	05
		Lower Separation Creek	1404020014	06
I & II	White-Yampa	Elkhead Creek	1405000106	01
		Fortification Creek	1405000107	02
		Dry Creek-Yampa River	1405000111	03
		Morgan Gulch-Yampa River	1405000202	04
		Deception Creek-Yampa River	1405000204	05
		Spring Creek-Yampa River	1405000205	06
		Hells Canyon-Yampa River	1405000206	07
		Little Snake River-Willow Creek	1405000302	08
		Fourmile Creek	1405000305	09
		Upper Sand Creek	1405000306	10
		Lower Sand Creek	1405000307	11
		Little Snake River-Powder Wash	1405000308	12
		Greasewood Gulch-Little Snake River	1405000309	13
		Sand Wash	1405000310	14
		Upper Muddy Creek	1405000401	15
		Redwash	1405000402	16
		Lower Muddy Creek	1405000403	17
		Wolf Creek	1405000701	18
		Outlet Douglas Creek	1405000703	19

Table 3.4-2 Watersheds Crossed by the TWE Project

General Project Region	Basin	Watershed	HUC-10[1]	Figure Code[2]
I & II (Continued)	White-Yampa (Continued)	Red Wash-White River	1405000704	20
		Dripping Rock Creek-White River	1405000705	21
		Evacuation Creek	1405000706	22
		Bitter Creek	1405000709	23
		Coyote Wash	1405000710	24
		Cottonwood Wash-White River	1405000711	25
		Lay Creek	1405000203	26
		Outlet Little Snake River	1405000311	27
		Crooked Wash-White River	1405000505	28
II	Colorado Headwaters	West Salt Creek	1401000517	01
		McDonald Creek-Colorado River	1401000519	02
II	Upper Colorado-Dolores	Bitter Creek	1403000101	01
		Westwater Creek	1403000102	02
		Cottonwood Canyon	1403000104	03
		Cisco Wash	1403000106	04
		Sagers Wash	1403000107	05
		Westwater Creek-Colorado River	1403000108	06
		Salt Wash	1403000501	07
II	Lower Green	Cliff Creek	1406000102	02
		Twelvemile Wash	1406000104	04
		Walker Hollow-Green River	1406000105	05
		Pelican Lake-Green River	1406000106	06
		Strawberry River-Duchesne River	1406000304	09
		Pigeon Water Creek-Lake Fork River	1406000308	10
		Dry Gulch Creek	1406000309	11
		Cottonwood Creek-Dry Gulch Creek	1406000310	12
		Uinta River	1406000314	13
		Duchesne River	1406000315	14
		Upper Strawberry River	1406000401	15
		Middle Strawberry River	1406000403	16
		Currant Creek	1406000404	17
		Red Creek	1406000405	18
		Rabbit Gulch	1406000406	19
		Lower Strawberry River	1406000408	20
		White River	1406000701	21
		Desert Seep Wash	1406000707	22

Table 3.4-2 Watersheds Crossed by the TWE Project

General Project Region	Basin	Watershed	HUC-10[1]	Figure Code[2]
II (Continued)	Lower Green (Continued)	Cottonwood Wash-Price River	1406000710	23
		Little Park Wash-Price River	1406000711	24
		Lost Spring Wash-Saleratus Wash	1406000801	25
		Tusher Wash-Green River	1406000802	35
		Little Grand Wash	1406000803	26
		Salt Wash-Green River	1406000804	27
		Tenmile Canyon	1406000805	28
		Huntington Creek	1406000901	29
		Cottonwood Creek	1406000902	30
		Ferron Creek	1406000903	31
		North Salt Wash	1406000904	32
		Upper San Rafael River	1406000905	33
		Antelope Creek	1406000305	36
		Upper Pariette Draw	1406000501	37
		Lower Pariette Draw	1406000502	38
		Upper Ninemile Creek	1406000503	39
		Lower Ninemile Creek	1406000504	40
		Sheep Wash-Green River	1406000505	41
		Agency Draw-Willow Creek	1406000604	42
		Scofield Reservoir	1406000702	43
		Willow Creek	1406000703	44
		Gordon Creek	1406000704	45
		Beaver Creek-Price River	1406000705	46
		Miller Creek	1406000706	47
		Coal Creek-Price River	1406000708	48
		Grassy Trail Creek	1406000709	49
		Indian Canyon	1406000407	50
		Avintaquin Creek	1406000402	51
II	Upper Colorado - Dirty Devil	Ivie Creek	1407000201	01
		Headwaters Muddy Creek	1407000202	02
II	Jordan	West Creek	1602020101	01
		Soldier Creek	1602020201	02
		Thistle Creek	1602020202	03
		Diamond Fork	1602020203	04
II	Great Salt Lake Basin	Dry Lake Creek-Fish Springs Wash	1602030603	01

Table 3.4-2 Watersheds Crossed by the TWE Project

General Project Region	Basin	Watershed	HUC-10[1]	Figure Code[2]
II & III	Escalante Desert-Sevier Lake	Salina Creek	1603000304	01
		Lost Creek-Sevier River	1603000305	02
		Silver Creek	1603000401	03
		Upper San Pitch River	1603000402	04
		Ivie Creek	1603000501	05
		Dog Valley Wash	1603000503	06
		Upper Sevier River	1603000504	07
		Tanner Creek	1603000505	08
		Cherry Creek Wash	1603000507	09
		Sugarville-Broad Canyon	1603000508	10
		Picture Rock Wash	1603000509	11
		Hog Back Reservoir-Old River Bed	1603000510	12
		Swasey Wash	1603000511	13
		Middle Sevier River	1603000512	14
		Chalk Creek	1603000514	15
		Oak Creek	1603000515	16
		Soap Hollow	1603000516	17
		Lower Sevier River	1603000517	18
		Iron Springs Creek-Frontal Lund Flats	1603000605	19
		Mud Spring Wash	1603000606	20
		Fisher's Wash	1603000607	21
		Fourmile Wash	1603000608	22
		Mountain Spring Wash	1603000609	23
		Gold Springs Wash	1603000610	24
		McDonald Wash-Negro Liza Wash	1603000612	25
		Shoal Creek	1603000613	26
		Escalante Valley-Pinto Creek	1603000614	27
		Long Lick Canyon-Big Wash	1603000703	28
		The Big Wash-Beaver River	1603000706	29
		Morehouse Canyon-Beaver River	1603000707	30
		Upper Beaver River	1603000803	31
		Lower Beaver River	1603000805	32
		Fillmore Wash-Frontal Sevier Lake	1603000903	33
III & IV	Lower Colorado-Lake Mead	Government Wash-Colorado River	1501000512	01
		Gypsum Wash-Colorado River	1501000513	02
		Moody Wash	1501000806	03

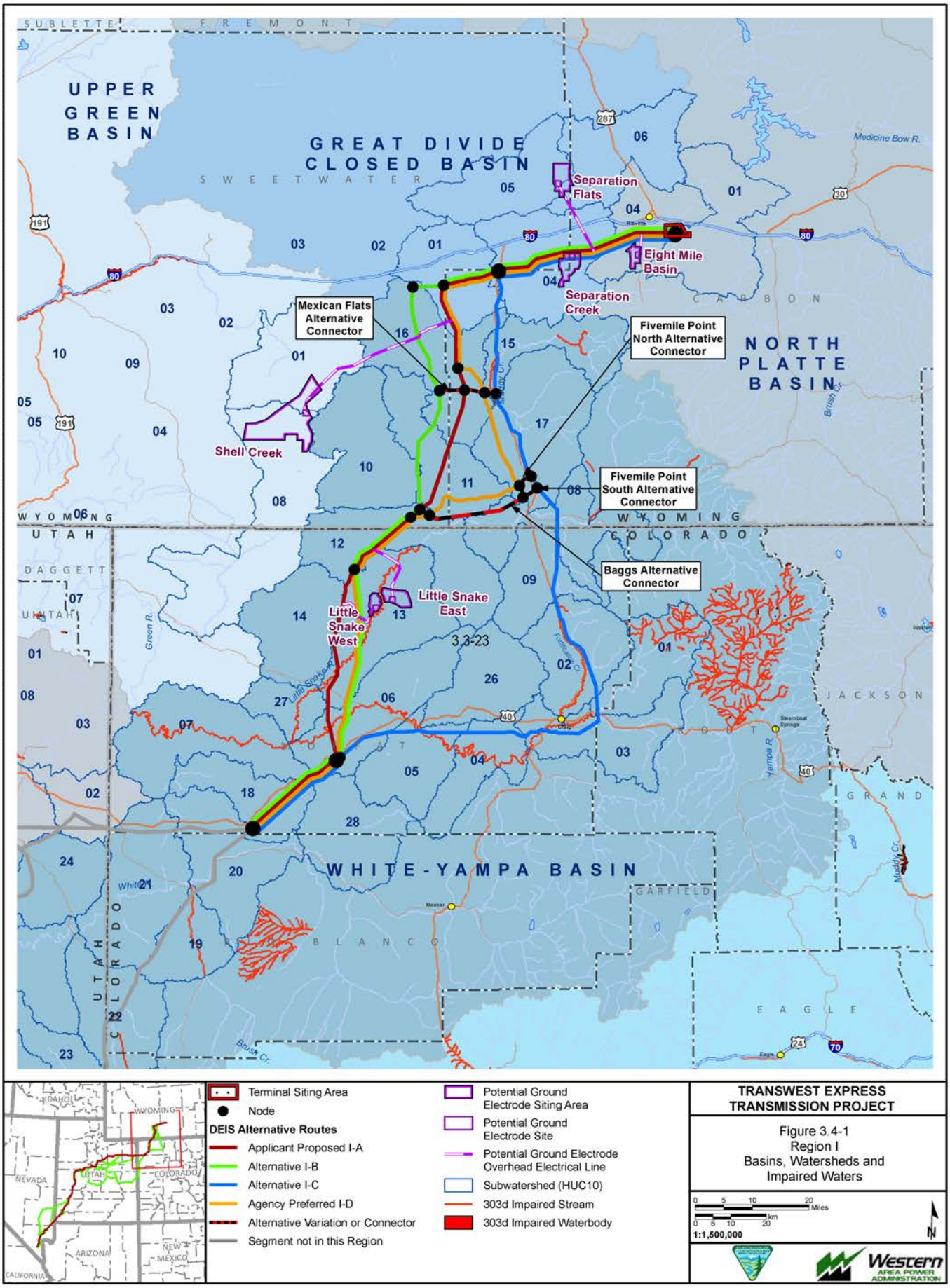
Table 3.4-2 Watersheds Crossed by the TWE Project

General Project Region	Basin	Watershed	HUC-10[1]	Figure Code[2]
III & IV (Continued)	Lower Colorado-Lake Mead (Continued)	Upper Santa Clara River	1501000807	04
		Lower Santa Clara River	1501000808	05
		Upper Beaver Dam Wash	1501001001	06
		Lower Beaver Dam Wash	1501001002	07
		Garden Wash	1501001004	08
		Toquop Wash	1501001005	09
		Sand Hollow Wash-Virgin River	1501001006	10
		Halfway Wash-Virgin River	1501001007	11
		Pahranagat Creek	1501001116	12
		Kane Springs Wash	1501001201	13
		Upper Pahranagat Wash	1501001202	14
		Middle Pahranagat Wash	1501001203	15
		Elbow Canyon	1501001204	16
		Dry Lake Valley	1501001206	17
		California Wash	1501001207	18
		Upper Muddy River	1501001208	19
		Lower Muddy River	1501001209	20
		Clover Creek	1501001305	21
		Cathedral Gorge-Meadow Valley Wash	1501001306	22
		Kershaw Canyon-Meadow Valley Wash	1501001307	23
		Lower Meadow Valley Wash	1501001309	24
		Nellis Air Force Base	1501001504	25
		Duck Creek-Las Vegas Wash	1501001507	26
		Lower Pahranagat Wash	1501001205	27
III & IV	Central Nevada Desert Basins	Red Rock Wash	1606000908	01
		Dry Lake Valley	1606000909	02
		Delamar Valley	1606000910	03
		Eldorado Valley	1606001518	04
		McCullough Spring	1606001516	05
		Ora Hanna Spring	1606001517	06
IV	Lower Colorado-Below Hoover Dam	Jumbo Wash-Colorado River	1503010101	01

[1] Ten digit USGS HUC, unique to each watershed.

[2] Figure Code refers to the watershed display system utilized on **Figures 3.4-1** through **3.4-4**.

Source: NRCS et al. 2010



TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.4-1
Region I
Basins, Watersheds and Impaired Waters

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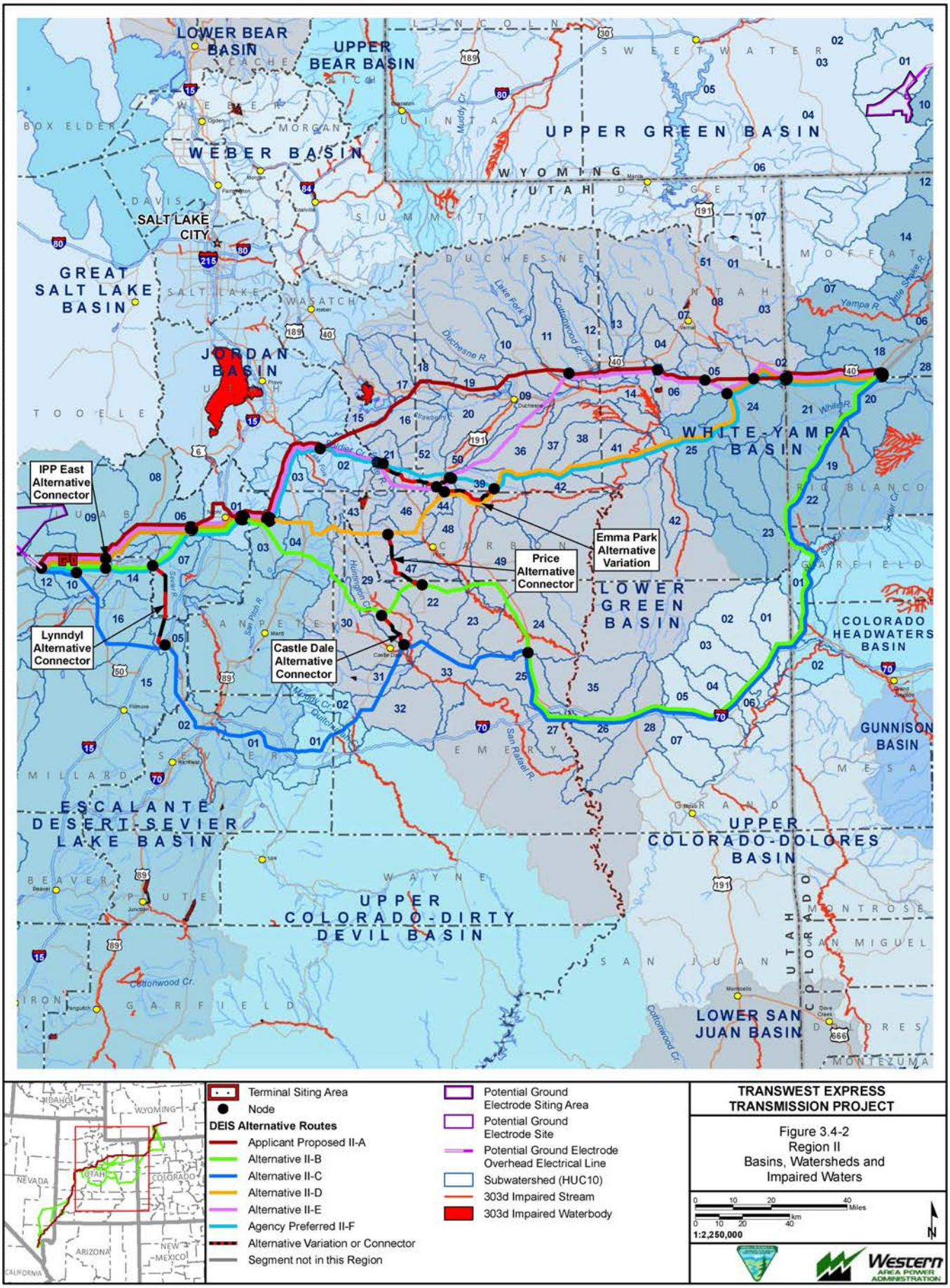

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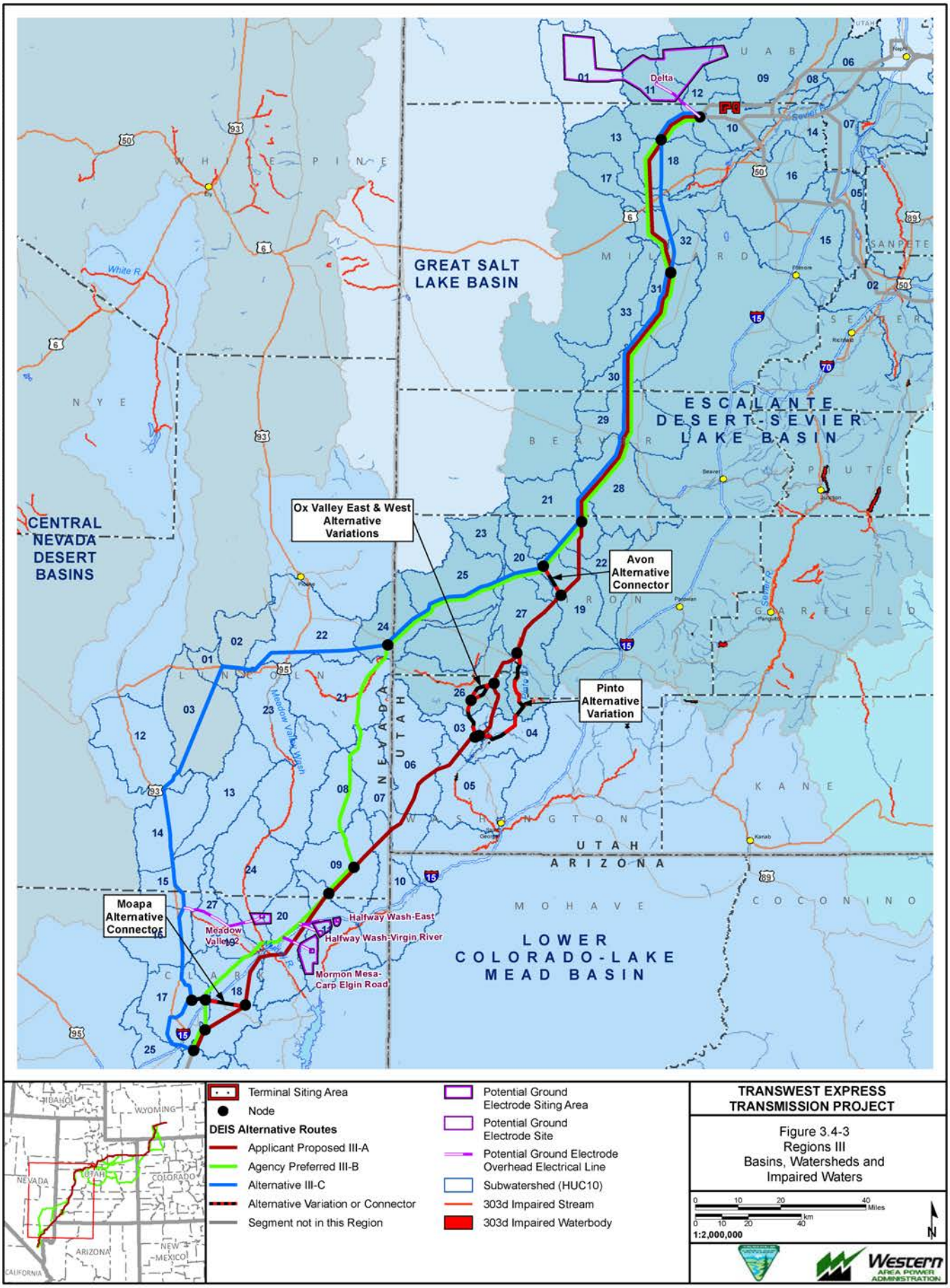
GREAT SALT LAKE BASIN
ESCALANTE DESERT-SEVIER LAKE BASIN
CENTRAL NEVADA DESERT BASINS
LOWER COLORADO-LAKE MEAD BASIN
Ox Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
Delta
Halfway Wash-East
Halfway Wash-Virgin River
Meadow Valley
Mormon Mesa-Carp Elgin Road
White R.
Meadow Valley Wash
Sevier R.
Virgin R.
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Subwatershed (HUC10)
303d Impaired Stream
303d Impaired Waterbody
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.4-3
Regions III
Basins, Watersheds and Impaired Waters
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Western AREA POWER ADMINISTRATION
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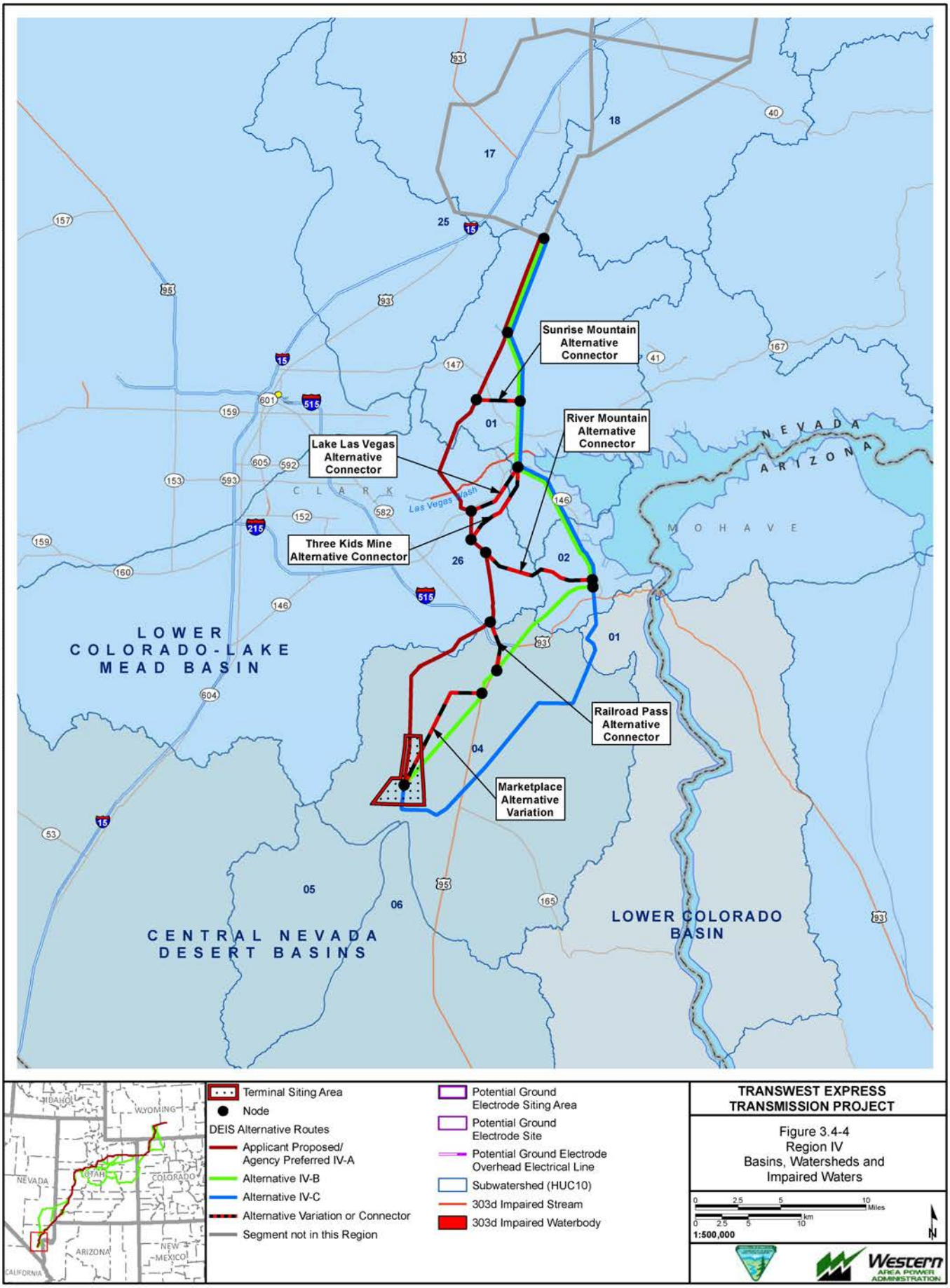

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Table 3.4-3 Major Rivers and Impaired Waters within Analysis Area and Project Regions

Project Region	River/Impaired Water	Reason for Impairment/TMDL[1,2]	Watershed	Hydrographic Basin
I	McKinney Creek	Removed 2012	Upper Muddy Creek	White-Yampa
	Muddy Creek	Removed 2012		
	Muddy Creek	TMDL: Phys Alt		
	Little Snake River	N/A	Little Snake River-Willow Creek	
			Little Snake River-Powder Wash	
	Little Snake River	Sed/Silt	Greasewood Gulch-Little Snake River	
			Outlet Little Snake River	
	Yampa River	Sed/Silt, Fe	Deception Creek-Yampa River	
			Spring Creek-Yampa River	
			Hells Canyon-Yampa River	
	Fortification Creek	Se	Fortification Creek	
	White River	N/A	Red Wash-White River	
			Dripping Rock Creek-White River	
			Asphalt Wash-White River	
			Cottonwood Wash-White River	
	Green River	N/A	Garden Creek-Green River	Lower Green
			Walker Hollow-Green River	
II	Douglas Creek	Sed/Silt	Outlet Douglas Creek	White-Yampa
	West Evacuation Creek	Sed/Silt	Evacuation Creek	
	Salt Creek	Sed/Silt, Se	West Salt Creek	Colorado Headwaters
	Colorado River	Se	McDonald Creek-Colorado River	
			Westwater Creek-Colorado River	Upper Colorado-Dolores
	Green River	N/A	Pelican Lake-Green River	Lower Green
			Sheep Wash-Green River	
			Tusher Wash-Green River	
			Salt Wash-Green River	
			Lower Pariette Draw	
	Pariette Draw and tributaries	Bo, Se, TDS		
			Upper Pariette Draw	
	Willow Creek	Bioassay	Agency Draw-Willow Creek	
	Ninemile Creek	Temp	Lower Ninemile Creek	
			Upper Ninemile Creek	
	Pelican Lake	pH	Pelican Lake-Green River	
	Duchesne River	TDS, Temp, Bioassay	Duchesne River	
	Strawberry River	Bo	Lower Strawberry River	
	Lake Fork River	Phys Alts; TMDL: TDS	Pigeon Water Creek-Lake Fork River	
	Antelope Creek and tributaries	Bo, TDS	Antelope Creek	
	Indian Canyon Creek	As, Bo, TDS	Indian Canyon	
	Red Creek Reservoir	DO	Red Creek	
	Soldier Creek	TMDL: P, Sed/Silt	Coal Creek-Price River	
	Price River	Bioassay		
			Beaver Creek-Price River	

Table 3.4-3 Major Rivers and Impaired Waters within Analysis Area and Project Regions

Project Region	River/Impaired Water	Reason for Impairment/TMDL[1,2]	Watershed	Hydrographic Basin
II (Cont)			Cottonwood Wash-Price River	Lower Green (Continued)
			Little Park Wash-Price River	
	San Rafael River	Bioassay	Upper San Rafael River	
	Huntington Creek	TMDL: TDS - Removed in 2010 listing	Huntington Creek	
		Se		
	Cottonwood Creek	TMDL: TDS	Cottonwood Creek	
	Scofield Reservoir	TMDL: DO, P, pH	Scofield Reservoir	
	Lower Gooseberry Reservoir	DO, P, pH		
	Quichupah Creek	Bioassay	Ivie Creek	Upper Colorado-Dirty Devil
	Soldier Creek	P, Sed/Silt	Soldier Creek	Jordan
	Currant Creek	Temp, pH	West Creek	
	Salina Creek	TMDL: TDS	Salina Creek	Escalante Desert-Sevier Lake
	San Pitch River	N/A	Upper San Pitch River	
	Sevier River	N/A	Upper Sevier River	
			Middle Sevier River	
III	Sevier River	N/A	Lower Sevier River	Escalante Desert-Sevier Lake
	Beaver River	N/A	The Big Wash-Beaver River	
			Morehouse Canyon-Beaver River	
			Upper Beaver River	
			Lower Beaver River	
	Newcastle Reservoir	TMDL: DO, P	Escalante Valley-Pinto Creek	
	Pinto Creek	Bioassay		
	Baker Reservoir	DO	Upper Santa Clara River	Lower Colorado-Lake Mead
	Santa Clara River	Temp, B	Lower Santa Clara River	
	Gunlock Reservoir	TMDL: DO		
	Meadow Valley Wash	P, Temp, B	Kershaw Canyon-Meadow Valley Wash	
			Lower Meadow Valley Wash	
	Muddy River	Temp, Fe, DO, P	Upper Muddy River	
	Muddy River	Temp, Fe, B, Mo, Mn	Lower Muddy River	
	Virgin River	Fe, Temp, P, Mn	Sand Hollow Wash-Virgin River	
			Halfway Wash-Virgin River	
IV	Duck Creek	Se, TDS,	Duck Creek-Las Vegas Wash	Lower Colorado-Lake Mead
	Las Vegas Wash	Fe, Mo; TMDL: P, NH3, Chlor		
	Colorado River	DO, Temp	Jumbo Wash-Colorado River	Lower Colorado-Below Hoover Dam

[1] TMDL – Total Maximum Daily Load

[2] Phys Alt – Physical Alterations; Sed – Sediment; Fe – Iron; Se – Selenium; Bo – Boron; TDS – Total Dissolved Solids; As – Arsenic; DO – Dissolved Oxygen; P – Phosphorous; Temp – Temperature; N/A – Not Applicable; Mo – Molybdenum; Mn – Manganese; NH_3 – Ammonia; Chlor – Chlorophyll-a.

Water use by Project Region is tabulated in **Table 3.4-4**. Regions I, II, and III reflect the major usage of agriculture with significant uses (greater than 1 percent) for thermoelectric uses and public supply, and small uses (less than 1 percent) of water for industrial, livestock, mining, aquaculture, and domestic purposes. The major use in Region IV is public supply, with significant uses for thermoelectric, irrigation,

and domestic uses. Uses for industrial applications, mining, and livestock also are present in small amounts (Kenny et al. 2009).

Table 3.4-4 Water Uses (Surface and Groundwater) in 2005 by Project Region

Project Region[1]	Unit[2]	Irrigation	Public Supply	Thermo-electric	Domestic	Industrial	Livestock	Aqua-culture	Mining (incl. Oil and Gas)	Total Water Use
I	acre-feet/year	703,147	17,060	41,546	706	1,859	1,837	907	1,714	768,776
	Percent	91	2	5	0.1	0.2	0.2	0.1	0.2	
II	acre-feet/year	3,423,837	189,864	85,825	5,858	16,993	7,449	48,357	5,153	3,783,335
	Percent	90	5	2	0.2	0.4	0.2	1	0.1	
III	acre-feet/year	955,145	60,700	25,080	2,711	2,083	6,116	280	1,479	1,053,594
	Percent	91	6	2	0.3	0.2	1	<0.1	0.1	
IV	acre-feet/year	17,474	602,031	28,239	23,870	5,993	146	0	3,002	680,755
	Percent	3	88	4	4	1	<0.1	0	0.4	
Total	Percent	81	14	3	1	0.4	0.2	1	0.2	6,286,461

[1] Water use reported by county. The counties crossed within each Project Region were totaled and reported.

[2] Percent is of total water use in that Project Region.

Source: Kenny et al. 2009.

3.4.6 Impacts to Water Resources

Potential impacts to water resources were identified through federal and state agency consultation and public scoping. These include potential impacts to surface water quality and quantity, such as increased erosion, sediment loads, turbidity, increased ion or salt concentrations, stream channel instability, and increased consumptive use of water. Also considered are potential impacts to springs and groundwater quality, such as degraded water quality or increased consumptive use.

Impacts to water resources would occur during the construction phase of the Project by ground disturbance for roadway, power line, terminal, temporary work areas, and electrode bed construction. Impacts also would occur when water is used for concrete batching and dust abatement. Impacts would continue into the operational phase at more localized areas where permanent disturbance occurs or where roads are constructed or widened at stream crossings, ephemeral drainage ways, or in close proximity to streams. Impacts of the decommissioning phase would be similar to those anticipated during construction. A COM Plan would be developed prior to construction and would include several specific plans relevant to water resources, including a Wetlands and Waters of the U.S. Plan, an Erosion Control Plan, and a Storm Water Pollution Prevention Plan, which will each address specific environmental impacts or localized conditions (TWE-19 and TWE-20). Relevant analysis considerations for water resources are described in **Table 3.4-5**.

Table 3.4-5 Relevant Analysis Considerations for Water Resources

Resource Topic	Analysis Considerations and Relevant Assumptions
Water quality (sedimentation) effects at waterway crossings	Quantify the number of perennial and intermittent waterbodies and crossings. Evaluate adequacy of design features and BMPs for disturbance restoration, sediment control, and bank restoration. It is assumed that the number of stream crossings along reference lines indicates the number of crossings by access roads. Quantify the acres of construction and operation disturbance within 300 feet and 100 feet of perennial streams. Quantify the change in road density from the construction and use of access roads within 300 feet and 100 feet of perennial streams.

Table 3.4-5 Relevant Analysis Considerations for Water Resources

Resource Topic	Analysis Considerations and Relevant Assumptions
Water quality (sedimentation) effects from upland disturbance	Quantify the size of construction disturbance areas. Estimate the relation to receiving perennial, intermittent, and ephemeral waterway crossings. Evaluate adequacy of design features and BMPs for disturbance restoration, sediment control, and bank restoration. Quantify the change in road density from the construction and use of access roads.
Floodplain obstruction and flooding damage	Identify locations of structures and/or ancillary facilities that would be constructed in river floodplain areas with the potential to obstruct overbank flows. A maximum span length of 1,500 feet is assumed; any floodplains requiring spans larger than this will require structures within the floodplain.
Water availability and use	Compare volume of water needed for Project construction to proposed water sources. Consider Project withdrawal rates and water demand at sources. Quantify water use from the Platte River and Colorado River basins.
Accidental releases of hazardous materials	Identify areas where accidental releases could impact both surface and groundwater quality. Evaluate adequacy of design features and BMPs to minimize and control releases.

3.4.6.1 Analyses Methodologies

GIS analyses were performed to quantify the number of stream crossings based on the reference line as well as the amount of potential disturbance based on the footprint of each alternative. Impacts to water quantity were analyzed by comparing the potential water use needed for construction of each alternative along with discussion regarding proposed sources. TransWest indicates that placement of structures in floodplains would be avoided with 1,500-foot spans between towers; however, floodplains crossed by alternatives for lengths greater than approximately 1,000 feet have been identified as areas that may necessitate potential tower sites. Due to the lack of consistent floodplain mapping in the analysis area, this was accomplished though desktop analysis of topographic maps and aerial photography.

Waterway Crossings

Although the locations of access roads have not been identified, the count of stream crossings by the reference lines along each alternative route have been analyzed as a parameter to estimate the magnitude of impacts from stream crossings during construction, operation, and decommissioning. Additionally, streams with impaired water quality and the reasons for the impairment are identified. This approach provides an overestimate of crossings considering TransWest would avoid crossings where possible by utilizing existing roads. Sedimentation impacts from utilization of existing roads are anticipated to be significantly less than impacts from construction of new roads. Furthermore, TransWest has estimated the disturbance from construction of access roads in different terrain types as a ratio of the length of the reference line (see **Appendix D**). An Access Road Plan would be developed by TransWest for the agency preferred alternative during final engineering and design, which would define site-specific access to each structure and temporary work area, including identification of necessary water-crossings, and would be included as part of the COM Plan.

Construction and operation ground disturbance within 100 feet and 300 feet of perennial waterways was quantified using the general methodology described in Section 3.0, Affected Environment and Environmental Consequences. This was done to provide an indication of impacts to water quality from increased erosion and sedimentation. Impacts to water quality from disturbance would decrease with increased distance from the streams. Because TransWest has committed to minimize the impacts to water resources and because there are multiple agency BMPs and stipulations that regulate disturbance near streams (see **Appendix C**), this methodology provides a conservative (overestimate) quantification of disturbance near streams.

Upland Disturbance

Ground disturbance was quantified using the general methodology described in Section 3.0, Affected Environment and Environmental Consequences. The analysis of indirect impacts to surface water quality is based on the assumption that surface disturbance within a given watershed serves as an indicator of the potential for increased sediment and salt runoff, and the acreage of disturbance is used as an impact parameter. Marston and Dolan (1988) conducted research to investigate the major criteria that control upland erosion in an environment similar to many locations within the analysis area. This research showed that slope and vegetative cover exert the most influence on upland erosion rates. Erosion was found to be inversely correlated with vegetation density (i.e., as vegetation density decreases, upland erosion increases).

The surface disturbance associated with the proposed Project would initially remove vegetative cover, which would increase surface runoff and exacerbate erosion. Areas needed for operation of the Project would remain disturbed, including the terminals and access roads; temporary work areas would be reclaimed. Once reclamation is complete in the temporary work areas, the vegetative cover would be reestablished, thereby decreasing erosion. As the vegetative cover approaches desired density levels, the erosion rate also would approach pre-construction levels. This is expected to occur within 3 to 5 years of initiating reclamation under general conditions; however, areas of low reclamation potential (see Section 3.3, Soils) and periods of minimal precipitation might extend this timeframe.

Road Density

Increased road density was analyzed within each affected watershed (HUC10) as a parameter to address impacts from increased erosion from construction and use of new roads. Existing road density was calculated as miles of road per square mile of watershed utilizing the TIGER Roads dataset (U.S. Census Bureau 2010) and the WBD (NRCS et al. 2010). Lengths of Project access roads were determined based on the access road model (see **Appendix D**) and were added to the lengths existing roads and density was recalculated by Project alternative. Existing and new road densities also were analyzed separately for the areas within 100 feet and 300 feet of perennial waters as parameters of the change in density near riparian areas where more change in density would constitute a greater impact to water quality. Because TransWest has committed to minimizing impacts to water resources and because there are multiple agency BMPs and stipulations that regulate disturbance near streams (see **Appendix C**), this methodology provides a conservative (overestimates) quantification of road density near streams.

Springs and Seeps

The NHD (NRCS et al. 2010) was used to define locations of springs and seeps across the analysis area. Springs and seeps located within the 2-mile transmission line corridor were analyzed along each alternative to provide a metric for potential to affect water quality at each location.

3.4.6.2 Impacts from Terminal Construction and Operation

The Northern and Southern terminals would be constructed regardless of alternative route or design option.

Northern Terminal

The Northern Terminal would be sited in the Sugar Creek watershed near Sinclair, Wyoming, and would require disturbance of 503 acres for construction and 234 acres for operation. This location is in a largely undisturbed upland area with low slopes that drain to the North Platte River approximately 10 miles away. Areas of water-erosion prone soils (see Section 3.3, Soils) as well as herbaceous wetland and woody riparian and wetland vegetative communities (see Section 3.5, Vegetation) are within this location. No streams, waterbodies, springs, or seeps are identified at the site.

During construction of the Northern Terminal, ground disturbance would remove vegetation and exacerbate upland erosion in susceptible areas. Erosion control design features such as water bars, cross drains, and vegetation restoration (TWE 13) would minimize upland erosion by directing runoff away from disturbed areas, decreasing velocities, and improving water infiltration. Agency BMPs including silt fencing (BMP WAT-9) also would mitigate impacts to receiving water bodies by providing sediment settling locations and engineered water velocity controls.

Water use for substation/converter station construction primarily would be for dust control during site preparation work. During this period, water trucks patrolling the site to control dust would make as many as one pass per hour over the site. Once site preparation work is complete, concrete for the placement of foundations becomes the largest use of water and dust control becomes minimal. Dust control activities are not expected to occur after construction is complete. Water required for construction of the Northern Terminal is estimated to be approximately 1.8 acre-feet (600,000 gallons), including dust control. Because the terminal is located in the Platte River Basin, it is assumed the source(s) of water will be from that basin as well. The required water would be procured from municipal sources, from commercial sources, or through a temporary water use agreement with landowners holding existing water rights. No new water rights would be required.

Magnesium chloride ($MgCl_2$) may be used in dust abatement. Several studies performed along roadways in Colorado where $MgCl_2$ has been used as a dust inhibitor or a deicer indicate that its use might increase the levels of these constituents in waterways depending on application rates, road proximity to waterways, and weather patterns, among others. These studies show that the increases did not approach concentration limits implemented by USEPA in drinking water secondary standards (Goodrich el al. 2009; Lewis 1999; Stevens 2001).

The potential for accidental releases of hazardous materials at the terminal would be greatest during the construction phase; however, this risk also would be present during the operation phase to a lesser extent. Construction and operation equipment and vehicles are potential sources of hazardous materials. Design features that would be implemented include performing refueling and maintenance activities in designated construction zones located more than 100 feet from waterways (TWE 24), and other prevention and containment measures as needed. A Spill Prevention, Control, and Countermeasure (SPCC) Plan would be prepared as part of the COM Plan (TWE 57), as required by federal law.

Conclusion: Through the implementation of the design features and BMPs, and considering the upland location of the terminal that is distant from waterways, little to no impacts to water quality are anticipated from construction disturbance. Terminal construction and operation would not be expected to alter the existing off-site drainage patterns, or degrade the water quality of streams and rivers. Because existing water rights would be utilized, no impacts to other water users would be anticipated. While the risk of accidental releases of hazardous materials would not be completely mitigated, the above described design features would minimize the risk of occurrence. In the event that an accidental release of hazardous materials did occur, it would have to travel more than 2 miles over upland areas and along ephemeral channels to reach a perennial stream (Sugar Creek) at a point greater than 9 miles upstream of the North Platte River.

Southern Terminal

The Southern Terminal or Alternate Southern Terminal would be sited in the Eldorado Valley watershed near Boulder City, Nevada, in an upland area that is already highly developed and drains to playa lakes at the bottom of a closed watershed. No streams, waterbodies, springs, or seeps are identified at either of the sites. Ground disturbance impacts would be similar to those discussed for the Northern Terminal, and the same design features and BMPs would be implemented to minimize impacts. Through the implementation of the design features and BMPs, and considering the upland locations of the terminals that are distant from waterways, little to no impacts to water quality are anticipated from construction disturbance.

These terminals would require disturbance of 412 acres for construction and 203 acres for operation. Water required for construction of the Southern Terminal or the Alternate Southern Terminal is estimated to be approximately 1.2 acre-feet (400,000 gallons), including dust control. The potential for accidental releases of hazardous materials is the same as discussed under the Northern Terminal.

Design Options 2 and 3

If either of the design options were implemented, the Southern Terminal or a substation would be constructed near IPP in Millard County, Utah (see Section 2.4.3.1, Northern and Southern Terminals). The proposed terminal or substation site near IPP is within the Sugarville-Broad Canyon Watershed and drains to the northwest via intermittent channels to a depression lake approximately 3 miles downstream.

The terminal near IPP under Design Option 2 would require 181 acres of construction disturbance and 118 acres of operation disturbance. The substation near IPP under Design Option 3 would require 161 acres of construction and 98 acres of operation disturbance in the same location. Because similar facilities and structures to the proposed action would be constructed for Design Option 2, it is assumed that the volume of water needed for construction of the terminal would be similar to that of the proposed action's Southern Terminal in the Eldorado Valley (1.2 acre-feet). Design Option 3 would require both the Substation near IPP and the Southern Terminal in the Eldorado Valley, effectively doubling the required water for construction (2.4 acre-feet). The potential for accidental releases of hazardous materials is the same as discussed under the Northern Terminal.

Conclusion: While the risk of accidental releases of hazardous materials would not be completely mitigated, the above described design features would minimize the risk of occurrence. In the event that an accidental release of hazardous materials did occur, the location of this terminal or substation is within and near the bottom of a closed watershed, limiting the geographic extent to this area. Due to the minimal volume of water required for terminal construction, and because existing and active water rights would be utilized, no impacts to other water users would be anticipated. Terminal construction and operation would not be expected to alter the existing off-site drainage patterns.

3.4.6.3 Impacts Common to all Alternative Routes and Associated Components

Construction Impacts

Water quality would be impacted both directly and indirectly from transmission line construction due to the ground disturbance necessary to complete the transmission line and related facilities. Ground disturbance includes areas cleared for construction, such as Project access roads, transmission line tower work areas, conductor stringing and tensioning sites, communication and regeneration sites, material storage yards, batch plants, fly yards, staging areas, and ground electrode systems.

New access roads, facilities, and other disturbed areas would be located away from waterbodies, wherever practicable. Access roads would be designed and constructed to minimize disruption of natural drainage patterns and waterbodies including rivers, streams, ephemeral streams, ponds, lakes, reservoirs, and playas. The roads and necessary stream crossings on BLM lands would be designed and constructed according to BLM manuals 9112, 9113, and the relevant RMPs. USFS standards and guidelines contained in the relevant LRMPs would dictate the road designs and construction practices on NFS lands. Practices described in these documents include avoiding development within riparian areas or employing mitigation if avoidance is not practical, siting stream crossings to minimize bank and channel disturbance and at 90-degree offsets (perpendicular) to channels, not siting new roads that parallel streams except where absolutely necessary, stabilization of stream banks which are damaged by development activities with methods that emphasize revegetation, and maintaining the natural complexity of riparian areas and their ability to act as effective sediment buffer zones.

Direct impacts would occur from the construction of access road waterway crossings, including crossings of perennial, intermittent, and ephemeral streams. **Appendix F** contains a detailed listing of waterbodies

crossed by Project reference lines. These impacts could come in the form of channel instability due to streambank disturbance and increased sediment supply from disturbed areas directly adjacent to the crossings. This may in turn cause increased sediment from mass wasting of channel banks, and down-cutting of the streambed, with resultant changes in channel geomorphology.

Although engineered access road locations have not been determined, three types of waterbody crossings are proposed:

1. Drive Through (Arizona Crossing): Crossing of a channel with minimal vegetation removal where no cut or fill is needed. This is typical for low-precipitation sagebrush country characterized by rolling topography and ephemeral streams that rarely flow with water.
2. Ford: Crossing of a channel that includes grading and stabilization. Stream banks and approaches would be graded and stabilized with rock or other erosion control devices to allow vehicle passage. Coarse rock would be installed in the streambed in a manner such that it would not raise the level of the streambed, allowing continued movement of water, fish and debris. This typically would be used on intermittent, larger ephemeral streams, or smaller perennial streams that would be expected to remain passable during a typical runoff season (e.g., estimated average peak streamflow in the magnitude of 100 cubic-feet per second [cfs] or less, and considering water velocity and depth).
3. Culvert: Crossing of a waterbody that includes installation of a culvert and construction of a stable road surface for vehicle passage over the culvert. Construction would occur during periods of low water. Culverts must be a minimum 18-inch diameter and able to pass a 10-year flow event. They typically would be partially buried in the streambed to maintain streambed material in the culvert. Non-erosive material would be placed around culverts to prevent scour or water flow outside the culvert. Stream banks and approaches also might be stabilized with rock or other erosion control devices. Culvert crossings could be used to limit impacts from in-stream erosion due to traffic within intermittent and smaller perennial streams.

During the final design phase, consultation would be conducted with the managing land agency regarding relevant standards and guidelines for waterbody road-crossing methods. Wherever needed, culverts, low-water crossings, and other devices of agency-approved design would be used to accommodate estimated peak flows of waterways (e.g., 10-year or 50-year flow event) according to the relevant land-managing agency requirements (see **Appendix C**). Each waterbody crossing would be designed and reviewed as advanced engineering is completed. Construction disturbances of banks and beds of waterbodies would be minimized during this design process. Performance of low water stream crossings (i.e., drive through and ford) and culvert installations would be monitored for the life of the access road, and maintained as necessary to preserve water quality. Waterbody crossings would be built as near as possible at right angles (perpendicular) to the streams and washes (TWE 8).

Through the implementation of the Project design features and the engineered design of crossings, the direct impacts would be greatest for short periods of time during construction and through the reclamation process until successful revegetation occurred. Erosion and sedimentation impacts would decrease, but would continue during operation due to the remaining access road disturbance. There are certain waterbodies that the state agencies have identified as having impaired uses due to elevated sediment concentrations or other constituents that might be present in stormwater runoff, among other causes (see **Table 3.4-3**). Access roads crossing these waterbodies would contribute to the sediment being mobilized to these streams. Design Feature TWE 20 states that the applicant will develop a management plan to avoid, reduce, and/or minimize adverse impacts to these streams. Additional BMPs contained in agencies' land-management guidance (BLM FO- and forest-specific) would apply to further minimize impacts, such as avoidance zones from waterways and specific requirements for access road crossing designs. These can be found in **Appendix C** and the documents listed in **Tables 1-3** and **1-4**.

Conclusion: Through the implementation of BMPs and applicant-committed design features, direct impacts to water quality from stream crossings would be limited to times when streamflow was present and/or vehicles were using the crossings or from unstable streambanks contributing sediment.

***WR-1**: Existing stream crossings would be utilized wherever requested by agencies. This would be developed on a site-specific basis during POD development. Stream crossings would be maintained as appropriate.*

***WR-2**: When existing crossings were not used, drive through (Arizona) crossings would not be utilized when un-protected (bare soil) streambeds are wet or when the stream is flowing water. This additional mitigation would reduce erosion and stream stability by limiting the crossing during times when the soil is highly susceptible to erosion.*

Indirect impacts to water quality could occur from ground disturbance required for construction of Project facilities in upland areas when precipitation events would cause overland runoff to erode bare soils and transport sediment to waterways, creating sedimentation, increased suspended sediment concentrations, and changes in channel geomorphology and stability. Structures would be sited a minimum distance of 200 feet from streams, whenever possible (TWE 8). Surface restoration would occur as required by the landowner or managing agency, returning the disturbed areas back to their natural contour, reseeding, and installing erosion control when necessary (TWE 13). Runoff from excavated (disturbed) areas would be controlled (TWE 22). Areas that would not require cut-and-fill for creation of a level workspace would have vegetation left in place wherever possible to maintain vegetation roots and increase soil stability (TWE 27). BMPs such as silt fences and check dams would further minimize this type of impact by trapping sediments or slowing the flow and allowing them to settle out of runoff before reaching the streams (BMP WAT-9). Additional agency BMPs and stipulations found in **Appendix C**, BLM RMPs, and USFS standards and guidelines also would be required as applicable, such as greater waterway setbacks. As successful reclamation and revegetation of the ground disturbance areas progress over multiple years, the erosion potential would decrease, nearing the pre-construction levels for all areas except those remaining disturbed during operation such as access roads.

The design features and BMPs discussed above and included in the Erosion Control Plan and Storm Water Pollution Prevention Plan would minimize runoff and erosion from disturbed areas; however, impacts from Project construction would result in increased erosion rates and sediment being delivered to streams. Although increased erosion would be expected, the disturbance would be dispersed along the linear path of the Project. No significant alterations to the existing drainage patterns or increases of off-site erosion would be expected from the disturbance of upland areas by the Project.

Transmission line structures located in floodplains have the potential to obstruct overbank flood flows, and to increase the risk of damage to the structures from debris in the water colliding with structures or by flows scouring around structure foundations. Project design features address facilities located in wetlands and WUS and state that the applicant would avoid locating structures in wetlands and WUS (TWE-20 and TWE-8), but do not specifically address structures in floodplains (see Section 3.7, Vegetation, for information on wetlands). The majority of floodplains could be spanned by the proposed transmission line, which has potential spans of up to 1,500 feet or more. Where a floodplain is wider than 1,500 feet, transmission line tower structures may require placement within the floodplain. Access roads are not anticipated to impact floodplains because they would be at grade and have minimal disturbance within floodplains. Floodplain development requirements are administered by the states and/or counties that would be crossed in accordance with FEMA regulations (44 CFR 60) and permit conditions would stipulate that structures must be engineered to withstand flood events and that no flood flow patterns would be altered.

Although transmission line tower structures may be necessary in floodplains, due to their “skeletal” design and minimal footprint (1 to 5 foundations per tower depending on type, approximately 10-foot diameter

each, see **Appendix D**), and through adherence to the permit requirements, they would not be expected to impede or redirect flood flows, adversely affect the capacity of the floodplains, or affect the pattern and magnitude of flood flows. Furthermore, because the span lengths could allow for placement of towers at distances of hundreds of feet from active river channels, no scour would be expected that would result in structural or property damage or that would impact the stability of the bed and banks of a waterway.

Water use for transmission line construction is for two primary purposes: foundation construction and ROW dust control. The required water would be procured from municipal sources, from commercial sources, or from temporary water use agreements with landowners holding existing water rights currently being used. No new water rights would be required. The estimated water required per mile of transmission line construction is approximately 3,400 gallons for foundation concrete and 240,000 gallons for dust control, totaling approximately 243,400 gallons (or approximately 0.75 acre-feet) per mile. Water requirements from each Hydrographic Region crossed (**Table 3.4-1**) are estimated based on the length of reference line crossing each.

Because existing water rights and uses (current depletion) would be utilized, no new impacts to other water users or the water source would be anticipated.

Spills or leaks of petroleum products and other hazardous materials from construction vehicles and equipment could impact water resources if they were to occur near, or be transported to, a waterway. TWE has committed to refuel and service vehicles in designated construction zones that are located more than 100 feet from waterways. Spill prevention and containment practices would be incorporated as needed (TWE 24), which would lessen the likelihood for a release and provide containment if a release occurred. A Hazardous Materials Management Plan will be prepared and all waste, including petroleum products and other potentially hazardous materials, would be removed to an authorized disposal facility (TWE 61). A SPCC Plan would be prepared as part of the COM Plan (TWE 57). If a reportable release occurs, the applicable agencies would be notified. TWE's contractor responsible for the release would be responsible for the clean-up (TWE 62).

While the risk of accidental releases of hazardous materials would not be completely mitigated, the above described design features would make it highly unlikely that water quality would be impacted due to Project construction.

Operation Impacts

Water quality would be impacted both directly and indirectly during the operation of the Project due to ground disturbance of permanent access roads and areas of unsuccessful reclamation due to poor reclamation potential.

Direct impacts at waterway crossings similar to those discussed for the construction phase would be anticipated. As stated in the construction phase discussion, the performance of low water stream crossings (i.e., drive through and ford) would be monitored as required by the agency for the life of the access road, and maintained as necessary to preserve water quality. Additionally, culverts installed in appropriate waterway crossings will be kept in good repair for the life of the access road.

This monitoring and maintenance, along with the design features discussed under construction impacts would decrease impacts to water quality; however, the Project would continue to contribute sediment from access road crossings. Existing drainage patterns would likely begin to stabilize as vehicle use at crossings was minimized during operations, but any changes in channel geomorphology that were created by construction would continue to alter stream channels and drainage for years until a new, stable channel is created either by reclamation efforts or the cycles of nature (10 to 100+ years).

Indirect impacts from bare soils on permanent access roads could occur by creating sedimentation issues and increased suspended sediment concentrations in streams. Design features such as water bars across

the roads (TWE 13) would decrease this impact by diverting water to undisturbed areas, thus, limiting the distance that water would run down disturbed areas and slowing the runoff once it reached the undisturbed, vegetated areas.

The design features and BMPs discussed under construction impacts and included in the Erosion Control Plan and Storm Water Pollution Prevention Plan would apply during Project operation and would minimize erosion from disturbed areas. However, increased erosion and sediment delivery would occur to streams from the access roads during periods of precipitation or snowmelt, especially in areas where roads are located in close proximity to streams.

Spills or leaks of petroleum products and other hazardous materials from operation and maintenance vehicles and equipment could impact water resources in the same manner as discussed under construction impacts; however, the risk for impacts is less due to a reduced number of vehicles and equipment in use.

While the risk of accidental releases of hazardous materials would not be completely mitigated, the design features discussed under construction impacts would apply during operations and would make it highly unlikely that water quality would be impacted due to Project operation.

Decommissioning Impacts

Impacts to water resources during the decommissioning phase of the Project would be similar to construction impacts.

3.4.6.4 Region I

Table 3.4-6 provides a tabulation of impacts associated with the alternative routes in Region I. Key impact parameters relate to the impact discussion in Section 3.4.6.2, Impacts Common to all Alternative Routes and Associated Components. Changes to road density within the affected watersheds (HUC10) are tabulated in **Table 3.4-7**. Specific differences by alternative are discussed below.

Table 3.4-6 Summary of Region I Alternative Route Impact Parameters

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Waterbody Crossings (count)				
Total	210	254	302	244
Perennial	2	2	18	4
Intermittent	203	250	270	235
Canals	1	1	6	1
Reservoirs/Lakes	4	1	8	4
Impaired	2	2	7	2
Springs/Seeps in 2-mile transmission line corridor	0	1	1	2
Floodplains over 1,000-feet wide (count)	2	2	5	3
Water Use (acre-feet)[1]	116	118	139	128
Construction Disturbance (acres)	2,057	2,083	2,511	2,306
Operation Disturbance (acres)	526	495	618	531
Construction Disturbance in Watersheds with Sediment or Alteration Impaired Steams (acres/percent of watershed)				
Upper Muddy Creek	N/A	N/A	165/0.1	N/A
Greasewood Gulch-Little Snake River	310/0.1	298/0.1	N/A	298/0.1
Deception Creek-Yampa River	N/A	N/A	185/0.1	N/A
Spring Creek-Yampa River	211/0.1	205/0.1	218/0.1	205/0.1
Hells Canyon-Yampa River	14/<0.1	14/<0.1	14/<0.1	14/<0.1

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Table 3.4-7 Summary of Road Density Changes by Watershed (HUC10) in Region I

Watershed Name	HUC10[2]	Existing Density (mi/mi^2)			Alternative I-A Added Density (mi/mi^2)			Alternative I-B Added Density (mi/mi^2)			Alternative I-C Added Density (mi/mi^2)			Alternative I-D Added Density (mi/mi^2)		
		100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC
Deception Creek-Yampa River[1]	1405000204	0.65	1.56	1.33							0.09	0.09	0.09			
Dry Creek-Yampa River	1405000111	1.66	2.28	1.94							0.04	0.04	0.08			
Elkhead Creek	1405000106	0.83	1.41	1.00							0.01	0.01	0.02			
Fortification Creek	1405000107	1.19	2.02	1.36							0.13	0.13	0.11			
Fourmile Creek	1405000305	0.59	1.04	1.02							0.09	0.40	0.09			
Frewen Lake	1404020004	0.50	1.59	2.08	0	0	0.10	0	0	0.07	0	0	0.01	0	0	0.10
Greasewood Gulch-Little Snake River[1]	1405000309	0.38	0.66	0.86	0.05	0.04	0.10	0.04	0.03	0.09				0.04	0.03	0.09
Hells Canyon-Yampa River[1]	1405000206	0.17	0.51	0.68	0	0	<0.01	0	0	<0.01	0	0	<0.01	0	0	<0.01
Little Snake River-Powder Wash	1405000308	0.31	0.58	1.25	0	0	0.07	0	0	0.07				0	0	0.07
Little Snake River-Willow Creek	1405000302	0.54	1.13	1.38							0.06	0.04	0.03			
Lower Muddy Creek	1405000403	1.08	2.13	1.36							0.07	0.05	0.07	0.02	0.02	0.05
Lower Sand Creek	1405000307	0.99	1.79	0.88	0	0	0.07	0	0	0.06				0	0	0.08
Morgan Gulch-Yampa River	1405000202	3.47	3.28	1.53							0	0	0.09			
Red Wash	1405000402	1.25	2.37	1.32	0	0	0.07	0	0	0.09	0	0.06	0.01	0	0	0.05
Sand Wash	1405000310	4.20	3.66	0.83	0	0	0.01									
Spring Creek-Yampa River[1]	1405000205	0.47	1.01	1.03	0.03	0.03	0.07	0.03	0.04	0.07	0	0	0.07	0.03	0.04	0.07
Sugar Creek	1018000213	1.45	2.46	2.58	0	0	0.08	0	0	0.08	0	0	0.08	0	0	0.08
Upper Muddy Creek[1]	1405000401	1.02	1.92	1.50							0.06	0.05	0.08	0	0	0.00
Upper Sand Creek	1405000306	1.26	1.82	0.63				0	0	0.01						
Upper Separation Creek	1404020013	3.59	4.87	2.07	0	0	0.08	0	0	0.08	0	0	0.09	0	0	0.08
Wolf Creek	1405000701	4.60	5.37	1.28	0	0	0.10	0	0	0.10	0	0	0.10	0	0	0.10

[1] Watershed contains stream(s) that currently are on the states' 303(d) Impaired Streams lists for sedimentation and/or physical alterations.

[2] Ten digit USGS HUC, unique to each watershed.

Notes: Road density is reported as miles of road divided by square miles of area. Blanks indicate watershed is not affected by the alternative.

100 feet: area of watershed within 100 feet of a perennial waterway; 300 feet: area of watershed within 300 feet of a perennial waterway; HUC 10: entire HUC10 Watershed area.

Sources: NRCS et al. 2010; U.S. Census Bureau 2010.

Alternative I-A (Applicant Proposed)

Key Parameters Summary

Alternative I-A would entail the crossing of two perennial streams, both of which are impaired. The Little Snake River (in Colorado) is impaired due to elevated sediment concentrations. The Yampa River has elevated sediment and iron concentrations. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to only include the potential for unstable streambanks to contribute sediment to the stream. The nearest existing crossing of the Little Snake River is nearly 4 straight line miles away on Highway 318 near Two Bar Ranch and the nearest crossing of the Yampa River is nearly 8 straight line miles away on Highway 318 near Sunbeam, Colorado.

Although many factors affect erosion in upland areas and sedimentation to streams (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative I-A increases no more than 0.1 mi/mi^2. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**).

Water use would require 116 acre-feet of water. Approximately 9 acre-feet of this need would come from the North Platte River drainage, with the remainder coming from the Upper Colorado drainage. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effect on other water users would be anticipated.

Alternative I-B

Key Parameters Summary

Alternative I-B would entail the crossing of two perennial streams, both of which are impaired. The Little Snake River (in Colorado) is impaired due to elevated sediment concentrations. The Yampa River has elevated sediment and iron concentrations. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would include the potential for unstable streambanks to contribute sediment to the stream. The nearest existing crossing of the Little Snake River is nearly 9 straight line miles away on Highway 318 near Two Bar Ranch and the nearest crossing of the Yampa River is approximately 4 straight line miles away on Highway 318 near Sunbeam, Colorado.

Although many factors affect erosion in upland areas and sedimentation to streams (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative I-B increases no more than 0.1 mi/mi^2. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**).

Water use would require 118 acre-feet of water. Approximately 9 acre-feet of this need would come from the North Platte River drainage, with the remainder coming from the Upper Colorado drainage. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effect on other water users would be anticipated.

Alternative I-C

Key Parameters Summary

Alternative I-C would entail the crossing of 18 perennial streams, three of which are impaired. Fortification Creek is impaired due to elevated selenium concentrations and the Yampa River is impaired for elevated sediment and iron concentrations. The State of Wyoming has developed a total maximum daily load (TMDL) to decrease impairment from physical alterations along Muddy Creek (5 crossings), and has applied for removal of the stream from the impaired waters list. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measure **WR-1**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to the stream. As part of mitigation measure **WR-1**, the existing crossings of Muddy Creek and Fortification Creek along Highway 789 would be utilized by the Project and no new crossings would be constructed. Likewise, existing crossings of the Yampa River around Craig, Colorado, and along Highway 40 would be utilized.

Although many factors affect erosion in upland areas and sedimentation to streams (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density, especially near perennial waterways. Road density due to Alternative I-C generally increases no more than 0.1 mi/mi^2, with the exception of two watersheds where the highest increase is 0.40 mi/mi^2 (Fourmile Creek Watershed).

Water use would require 139 acre-feet of water. Approximately 9 acre-feet of this need would come from the North Platte River drainage, with the remainder coming from the Upper Colorado drainage. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effect on other water users would be anticipated.

Alternative I-D (Agency Preferred)

Key Parameters Summary

Alternative I-D would entail the crossing of four perennial streams, two of which are impaired. The Little Snake River (in Colorado) is impaired due to elevated sediment concentrations. The Yampa River has elevated sediment and iron concentrations. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to only include the potential for unstable streambanks to contribute sediment to the stream. The nearest existing crossing of the Little Snake River is nearly 9 straight line miles away on Highway 318 near Two Bar Ranch and the nearest crossing of the Yampa River is approximately 4 straight line miles away on Highway 318 near Sunbeam, Colorado.

Although many factors affect erosion in upland areas and sedimentation to streams (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative I-D increases no more than 0.1 mi/mi^2. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**).

Water use would require 128 acre-feet of water. Approximately 9 acre-feet of this need would come from the North Platte River drainage, with the remainder coming from the Upper Colorado drainage. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effect on other water users would be anticipated.

Alternative Connectors in Region I

Each of the alternative connectors in Region I would include minor variations in the total number of waterbodies crossed, disturbed areas, and water use if they were to be utilized. The Mexican Flats Alternative Connector would cross one impaired waterbody; however the existing crossing of Muddy Creek by the secondary road outside of Dad, Wyoming, would be utilized. The Baggs Alternative Connector would cross one large floodplain where it crosses Muddy Creek. **Table 3.4-8** summarizes impacts associated with the alternative connectors in Region I.

Table 3.4-8 Summary of Region I Alternative Connector Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use (acre-feet)[1]	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canal	Reservoirs/Lakes	Impaired				
Mexican Flats Alternative Connector	19	1	18	0	0	1	0	10	129	26
Conclusion	There are no apparent unique conditions or constraints for water resources by utilizing this connector.									
Baggs Alternative Connector	25	1	24	0	0	0	1	23	294	70
Conclusion	There are no apparent unique conditions or constraints for water resources by utilizing this connector.									
Fivemile Point North Alternative Connector	6	1	5	0	0	0	0	3	82	8
Conclusion	There are no apparent unique conditions or constraints for water resources by utilizing this connector.									
Fivemile Point South Alternative Connector	4	0	4	0	0	0	0	2	31	6
Conclusion	There are no apparent unique conditions or constraints for water resources by utilizing this connector.									

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Alternative Ground Electrode Systems in Region I

It would be necessary to locate the northern ground electrode system within 100 miles of the Northern Terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by TWE. The impacts associated with constructing and operating this system are the same as those discussed in Section 3.4.6.2, Impacts Common to all Alternative Routes and Associated Components. **Table 3.4-9** summarizes impacts associated with the eight combinations of alternative routes and location possibilities for the northern ground electrode system.

Table 3.4-9 Summary of Region I Alternative Ground Electrode System Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use[1] (acre-feet)	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canal	Reservoirs/Lakes	Impaired				
Separation Flat (All Alternatives)	25	0	25	0	0	0	0	10	128	39
Shell Creek (Alternatives I-A and I-D)	68	0	68	0	0	0	0	25	223	89
Little Snake East (Alternatives I-A, I-B, and I-D)	16	0	16	0	0	0	0	7	108	29
Little Snake West (Alternative I-A)	15	0	15	0	0	0	0	7	121	37

Table 3.4-9 Summary of Region I Alternative Ground Electrode System Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use[1] (acre-feet)	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canal	Reservoirs/Lakes	Impaired				
Shell Creek (Alternative I-B)	62	0	62	0	0	0	0	20	189	71
Little Snake West (Alternative I-B and I-D)	21	0	21	0	0	0	0	10	93	21
Cottonwood Creek (Alternative I-C)	4	0	4	0	0	0	0	3	89	19
Separation Creek (All Alternatives)	2	0	2	0	0	0	0	10	138	48
Eight Mile Basin (All Alternatives)	7	0	7	0	0	0	0	3	86	18

[1] Estimation of water use based on assumptions provided for construction of a 600kV DC transmission line.

Region I Conclusion

Within Region I, Alternative I-C exhibits the highest impacts of all alternatives, with the most streams crossed, impaired streams crossed, floodplains crossed, water use, and construction and operation disturbance. Between the other alternatives (I-A, I-B, and I-D), there is no distinct difference in potential impacts to water resources.

3.4.6.5 Region II

Table 3.4-10 provides a tabulation of impacts associated with the alternative routes in Region II. Key impact parameters relate to the impact discussion in Section 3.4.6.2, Impacts Common to all Alternative Routes and Associated Components. Changes to road density within the affected watersheds (HUC10) are tabulated in **Table 3.4-11**. Specific differences by alternative are discussed below.

Table 3.4-10 Summary of Region II Alternative Route Impact Parameters

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Waterbody Crossings (count)						
Total	360	579	541	348	415	336
Perennial	19	26	24	17	40	27
Intermittent	298	522	468	315	345	302
Canals	40	19	37	14	26	6
Reservoirs/Lakes	3	5	12	2	4	1
Impaired	4	3	5	1	5	3
Springs/Seeps in 2-mile transmission line corridor	6	7	5	2	7	4
Floodplains over 1,000 feet wide (count)	2	4	4	1	2	2
Water Use (acre-feet)	192	258	272	195	199	199
Construction Disturbance (acres)	3,745	5,003	5,066	4,055	3,935	4,276
Operation Disturbance (acres)	1,178	1,436	1,308	1,223	1,195	1,392
Construction Disturbance in Watersheds with Sediment or Alteration Impaired Streams (acres/percent of watershed)						
Outlet Douglas Creek	N/A	238/0.2%	238/0.2%	N/A	N/A	N/A
Evacuation Creek	N/A	286/0.2%	286/0.2%	N/A	N/A	N/A
Pigeon Water Creek-Lake Fork River	87/0.1%	N/A	N/A	N/A	83/0.1%	N/A

Table 3.4-10 Summary of Region II Alternative Route Impact Parameters

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Coal Creek-Price River	N/A	53/<0.1%	N/A	7/<0.1%	N/A	7/<0.1%
Soldier Creek	272/0.2%	N/A	N/A	N/A	384/0.3%	384/0.3%

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Alternative II-A (Applicant Proposed)

Key Parameters Summary

Alternative II-A would entail the crossing of 19 perennial streams, four of which are impaired. The State of Utah has developed a TMDL for total dissolved solids (TDS) on the Lake Fork River. The Duchesne River is impaired because of elevated TDS concentrations and elevated water temperature, and observed bio-toxicity. Soldier Creek is impaired due to elevated nutrients, phosphorus, and sedimentation; Lake Fork (Soldier Creek) is listed as an impaired stream due to elevated TDS concentrations and sedimentation. Utah Department of Environmental Quality (UDEQ) (2010) has requested that the Lake Fork River be delisted. Each of these streams has existing crossing locations nearby that could be utilized according to mitigation measure **WR-1**. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to the stream. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative II-A generally increases no more than 0.1 mi/mi^2, with exceptions in 12 watersheds where the highest increase in road density of 0.27 mi/mi^2 was calculated within the 100-foot perennial of the Soldier Creek Watershed. Additionally, agency stipulations for the affected BLM FOs and USFS-administered lands require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 192 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative II-B

Key Parameters Summary

Alternative II-B would entail the crossing of 26 perennial streams, three of which are impaired. Douglas Creek is impaired due to sedimentation. West Salt Creek (crossed 37 times, 5 of which are in perennial reaches) is impaired due to elevated sediment and iron concentrations. Huntington Creek has an established TMDL for TDS. UDEQ (2010) has requested that Huntington Creek be delisted. There are no obvious existing crossings of West Salt Creek along approximately 2 miles of perennial stream and 11 miles of intermittent stream that could be utilized, and construction of new crossings or use of Arizona or ford crossings would increase erosion and sedimentation in this stream. The locations of both Douglas Creek and Huntington Creek proposed new crossings have existing crossings within 2 miles or less that could be utilized. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only those discussed along West Salt Creek, as well as the potential for unstable streambanks to contribute sediment to the stream. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative II-B generally increases no more than 0.1 mi/mi^2, with exceptions in 13 watersheds where the highest increase in road density of 1.33 mi/mi^2 was calculated within the 100-foot perennial buffer of West Salt Creek Watershed.

Table 3.4-11 Summary of Road Density Changes by Watershed (HUC 10) in Region II

Watershed Name	HUC10[2]	Existing Density (mi/mi²)			Alternative II-A Added Density (mi/mi²)			Alternative II-B Added Density (mi/mi²)			Alternative II-C Added Density (mi/mi²)			Alternative II-D Added Density (mi/mi²)			Alternative II-E Added Density (mi/mi²)			Alternative II-F Added Density (mi/mi²)		
		100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC
Agency Draw-Willow Creek	1406000604	3.30	4.19	1.60										0.07	0.06	0.08				0.07	0.06	0.08
Antelope Creek	1406000305	3.12	4.97	1.07										0	0	0.02	3.56	3.74	0.17	0	0	0.02
Avintaquin Creek	1406000402	1.76	1.54	0.94																0	0	0.03
Beaver Creek-Price River	1406000705	7.16	6.85	2.45										0.03	0.06	0.11	0.12	0.20	0.07	0.03	0.03	0.05
Bitter Creek	1403000101	0	0.12	1.53				0	0	0.07	0	0	0.07									
Bitter Creek	1405000709	4.34	4.96	1.33				0	0.04	0.02	0	0.04	0.02									
Chalk Creek	1603000514	11.43	5.46	2.08							0	0	0.03									
Cherry Creek Wash	1603000507	9.61	7.25	1.46	0	0	0.02							0	0	0.02	0	0	0.02			
Cisco Wash	1403000106	0	1.88	0.82				0	0	0.06	0	0	0.06									
Cliff Creek	1406000102	0.40	5.63	1.60	0	0	0.09							0	0	0.10	0	0	0.10	0	0	0.10
Coal Creek-Price River[1]	1406000708	2.03	2.90	2.62				0.12	0.08	0.02				0	0	<0.01						
Cottonwood Canyon	1403000104	4.50	3.77	0.56				0	0	0.03	0	0	0.03									
Cottonwood Creek	1406000902	1.63	2.97	1.64				0.01	0.01	0.08	0.01	0.01	0.03									
Cottonwood Creek-Dry Gulch Creek	1406000310	1.95	2.74	2.22	0.18	0.11	0.06										0.18	0.11	0.06			
Cottonwood Wash-White River	1405000711	0.36	0.79	1.70										0.05	0.05	0.08	0	0	0.01	0.05	0.05	0.08
Coyote Wash	1405000710	1.94	2.38	1.96										0.42	0.67	0.14	0.20	0.19	0.04	0.42	0.67	0.14
Currant Creek	1406000404	3.46	3.43	1.99	0.01	0.03	0.05															
Desert Seep Wash	1406000707	1.18	1.62	1.81				0.05	0.05	0.13												
Dog Valley Wash	1603000503	8.49	4.73	2.01	0	0	0.15	0	0	0.09				0	0	0.14	0	0	0.14	0	0	0.09
Dripping Rock Creek-White River	1405000705	1.54	2.80	1.96	0.03	0.03	0.04	0	0	<0.01	0	0	<0.01	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.04
Dry Gulch Creek	1406000309	1.64	2.45	2.13	0.21	0.18	0.07										0.21	0.16	0.03			
Duchesne River	1406000315	0.98	1.34	2.29	0	0	0.02										0	0	0.03			
Evacuation Creek[1]	1405000706	3.93	4.77	1.03				0	0	0.11	0	0	0.11									
Ferron Creek	1406000903	1.57	2.10	1.51							0.01	0.02	0.06									
Gordon Creek	1406000704	4.22	4.44	2.08										0.08	0.09	0.20						
Grassy Trail Creek	1406000709	11.58	7.38	1.70				0	0	0.05												
Headwaters Muddy Creek	1407000202	2.01	2.10	1.80							0.03	0.04	0.05									
Hog Back Reservoir-Old River Bed	1603000510	0	0.70	1.13	0	0	0.01	0	0	0.01	0	0	0.01	0	0	0.01	0	0	0.01	0	0	0.01
Huntington Creek	1406000901	3.94	4.22	1.65				0.03	0.03	0.10	0.01	0.01	0.03	0.01	0.01	0.03						
Ivie Creek	1407000201	3.91	6.30	2.90							0.07	0.20	0.11									
Ivie Creek	1603000501	3.50	3.53	1.87							0.05	0.15	0.20									
Little Grand Wash	1406000803	1.09	1.56	0.78				0.07	0.08	0.17	0.07	0.08	0.17									
Little Park Wash-Price River	1406000711	3.17	3.12	0.99				0.06	0.04	0.07	0	0	0.03									
Lost Creek-Sevier River	1603000305	9.67	9.84	4.88							0.06	0.08	0.09									
Lost Spring Wash-Saleratus Wash	1406000801	0.44	1.82	1.10				0	0	0.12	0	0	0.18									
Lower Ninemile Creek	1406000504	4.82	3.83	1.02										0	0	0.03				0	0	0.03
Lower Pariette Draw	1406000502	0.56	1.05	1.55										0	0	0.04				0	0	0.04
Lower Strawberry River	1406000408	1.00	2.14	1.74	0	0	0.04															
McDonald Creek-Colorado River	1401000519	0.17	0.43	1.04				0	0	0.03	0	0	0.03									
Middle Sevier River	1603000512	1.45	2.18	2.28				0.01	0.02	0.08	0.04	0.04	0.03							0.01	0.02	0.08
Middle Strawberry River	1406000403	8.03	5.55	1.30	0	0.08	0.14															
North Salt Wash	1406000904	4.07	4.16	1.15							0	0	0.05									

Table 3.4-11 Summary of Road Density Changes by Watershed (HUC 10) in Region II

Watershed Name	HUC10[2]	Existing Density (mi/mi²)			Alternative II-A Added Density (mi/mi²)			Alternative II-B Added Density (mi/mi²)			Alternative II-C Added Density (mi/mi²)			Alternative II-D Added Density (mi/mi²)			Alternative II-E Added Density (mi/mi²)			Alternative II-F Added Density (mi/mi²)		
		100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC
Oak Creek	1603000515	8.63	6.17	1.93							0	0	0.07									
Outlet Douglas Creek[1]	1405000703	1.14	3.28	1.51				0.16	0.38	0.17	0.16	0.38	0.17									
Pelican Lake-Green River	1406000106	0.55	1.44	1.94	0.03	0.03	0.13										0.03	0.03	0.13			
Pigeon Water Creek-Lake Fork River[1]	1406000308	0.84	1.47	2.23	0.06	0.06	0.06										0.11	0.16	0.04			
Rabbit Gulch	1406000406	0.37	1.70	2.12	0	0	0.21															
Red Creek	1406000405	3.50	4.73	2.46	0.05	0.09	0.13															
Red Wash-White River	1405000704	1.18	2.61	1.41	0	0	0.06	0.06	0.05	0.07	0.06	0.05	0.07	0	0	0.06	0	0	0.06	0	0	0.06
Sagers Wash	1403000107	1.40	1.58	1.03				0.22	0.23	0.09	0.22	0.23	0.09									
Salina Creek	1603000304	8.89	12.15	3.83							0.13	0.13	0.12									
Salt Wash	1403000501	0.14	0.32	0.91				0	0	0.02	0	0	0.02									
Salt Wash-Green River	1406000804	0.13	0.64	1.54				0.04	0.04	0.06	0.04	0.04	0.06									
Scofield Reservoir	1406000702	3.90	4.66	2.67										0.03	0.16	0.09	0.01	0.01	<0.01			
Sheep Wash-Green River	1406000505	0.09	0.33	1.21										0.06	0.06	0.16				0.06	0.06	0.16
Silver Creek	1603000401	2.09	3.10	2.55				0.04	0.10	0.22				0	0	0.08						
Soldier Creek[1]	1602020201	8.48	6.99	2.45	0.27	0.19	0.16										0.53	0.44	0.25	0.53	0.44	0.25
Strawberry River-Duchesne River	1406000304	1.57	1.95	2.39	0.10	0.08	0.08										0.16	0.13	0.10			
Sugarville-Broad Canyon	1603000508	3.99	3.04	1.18	0	0	0.12	0	0	0.13	0	0	0.11	0	0	0.12	0	0	0.12	0	0	0.13
Tanner Creek	1603000505	5.90	4.83	2.20	0	0	0.07							0	0	0.07	0	0	0.07			
Tenmile Canyon	1406000805	4.00	4.85	1.31				0.17	0.16	0.04	0.17	0.16	0.04									
Thistle Creek	1602020202	10.98	7.25	2.76	0.23	0.19	0.20										0.23	0.19	0.20	0.23	0.19	0.20
Tusher Wash-Green River	1406000802	3.40	3.75	0.73				0	0	<0.01	0	0	<0.01									
Uinta River	1406000314	1.41	2.20	2.16	0.01	0.01	0.04										0.01	0.01	0.04			
Upper Ninemile Creek	1406000503	4.05	4.59	0.99										0.08	0.09	0.20	0.48	0.39	0.05	0.06	0.08	0.26
Upper Pariette Draw	1406000501	1.41	1.70	1.87										0	0	0.05				0	0	0.05
Upper San Pitch River	1603000402	4.29	4.57	2.94				0.54	0.45	0.16				0.08	0.18	0.13						
Upper San Rafael River	1406000905	0.70	0.95	1.30							0	0	0.08									
Upper Sevier River	1603000504	0.99	1.90	1.71				0.06	0.06	0.08										0.06	0.06	0.08
Upper Strawberry River	1406000401	1.03	1.61	1.72	0	0	0.05															
Walker Hollow-Green River	1406000105	0.79	1.99	2.46	0	0	0.18							0	0	0.01	0	0	0.08	0	0	0.01
West Creek	1602020101	3.67	4.24	2.08	0.22	0.24	0.20	0.07	0.08	0.13				0.14	0.16	0.17	0.16	0.19	0.20	0.16	0.19	0.20
West Salt Creek	1401000517	5.55	4.61	1.04				1.33	0.84	0.18	1.33	0.84	0.18									
Westwater Creek	1403000102	4.25	3.68	0.96				0	0	0.04	0	0	0.04									
Westwater Creek-Colorado River	1403000108	0.38	0.65	1.20				0	0	0.05	0	0	0.05									
White River	1406000701	6.37	6.29	2.44													0.04	0.06	0.11	0.19	0.24	0.16
Willow Creek	1406000703	4.16	4.26	1.37										0.21	0.50	0.30	0.43	0.45	0.23	0	0	0.24
Wolf Creek	1405000701	4.60	5.37	1.28	0	0	0.01	0	0	0.01	0	0	0.01	0	0	0.01	0	0	0.01	0	0	0.01

[1] Watershed contains stream(s) that are currently on the states' 303(d) Impaired Streams lists for sedimentation and/or physical alterations.
[2] Ten digit USGS HUC, unique to each watershed.

Note: Road density is reported as miles of road divided by square miles of area. Blanks indicate watershed is not affected by the alternative.
100 feet: area of watershed within 100 feet of a perennial waterway; 300 feet: area of watershed within 300 feet of a perennial waterway; HUC 10: entire HUC 10 Watershed area.

Sources: NRCS et al. 2010; U.S. Census Bureau 2010.

Additionally, agency stipulations for the affected BLM FOs and USFS-administered lands require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 258 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative II-C

Key Parameters Summary

Alternative II-C would entail the crossing of 24 perennial streams, five of which are impaired. Cottonwood Creek is impaired due to elevated TSD. Douglas Creek is impaired due to sedimentation. West Salt Creek (crossed 37 times) is impaired due to elevated sediment and iron concentrations. Huntington Creek is impaired for elevated selenium concentrations. Quitchupah Creek is listed due to observed bio-toxicity. As discussed for Alternative II-B, impacts from crossings of West Salt Creek would increase erosion and sedimentation due to the need for construction of multiple crossings. The locations of Douglas Creek, Huntington Creek, and Quitchupah Creek proposed new crossings have existing crossings within 2 miles or less that could be utilized. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only those discussed along West Salt Creek as well as the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative II-C generally increases no more than 0.1 mi/mi^2, with exceptions in 10 watersheds where the highest increase in road density of 1.33 mi/mi^2 was calculated within the 300-foot perennial buffer of West Salt Creek Watershed. Additionally, agency stipulations for the affected BLM FOs and USFS-administered lands require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 272 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative II-D

Key Parameters Summary

Alternative II-D would entail the crossing of 17 perennial streams, one of which is impaired. Willow Creek (tributary to Green River) is listed due to observed bio-toxicity. The nearest mapped existing crossing on Willow Creek is approximately 3 straight-line miles away. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only those discussed along Cottonwood Creek as well as the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative II-D generally increases no more than 0.1 mi/mi^2, with exceptions in 11 watersheds where the highest increase in road density of 0.67 mi/mi^2 was calculated within the 300-foot perennial buffer of Coyote Wash Watershed. Additionally, agency stipulations for the affected BLM FOs and USFS-administered lands require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 195 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative II-E

Key Parameters Summary

Alternative II-E would entail the crossing of 40 perennial streams, five of which are impaired. The State of Utah has developed a TMDL for TDS on the Lake Fork River. The Duchesne River is listed due to elevated TDS concentrations and elevated water temperature, and observed bio-toxicity. Sowers Creek (crossed 5 times) is impaired due to elevated TDS and boron concentrations. Soldier Creek (crossed 5 times) is impaired due to elevated nutrients, phosphorus, and sedimentation. Lake Fork River (Soldier Creek) is listed as an impaired stream due to elevated TDS concentrations and sedimentation. UDEQ (2010) has requested that the Lake Fork River be delisted. Existing crossings of the Duchesne River, Lake Fork River, Soldier Creek, and Lake Fork River (Soldier Creek) exist within several miles or less from proposed new crossings. The reference line follows Sowers Creek through a narrow canyon for approximately 15 miles, crossing the stream numerous times. The road along this stretch of the creek is a small “cherrystem” into USFS inventoried roadless area. No apparent existing crossings exist along portions of this canyon, and the construction of crossings would increase erosion and sedimentation in this stream, which also would further increase the TDS concentrations. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only those discussed along Sowers Creek, as well as the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative II-E generally increases around 0.1 mi/mi^2, with exceptions in 16 watersheds where the highest increase in road density of 3.74 mi/mi^2 was calculated within the 300-foot perennial buffer of Antelope Creek Watershed (Sowers Creek). Additionally, agency stipulations for the affected BLM FOs and USFS-administered lands require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 199 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative II-F (Agency Preferred)

Key Parameters Summary

Alternative II-F would require 336 stream crossings, 27 of which are perennial. Of those crossings, three streams are impaired: Lake Fork River (Soldier Creek) is impaired for sedimentation/siltation and TDS, Soldier Creek (crossed five times) is impaired for sedimentation/siltation and phosphorus, and Willow Creek (tributary of Green River) is listed due to observed bio-toxicity. Each of these streams has existing crossing locations nearby that could be utilized according to mitigation measure **WR-1**. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impact to water quality from stream crossings would be minimized. An increased contribution of sediment would be expected from upland areas relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density generally increases by no more than 0.1 mi/mi^2 in watersheds affected by this alternative, with the exception of nine watersheds. The highest increase is in the Coyote Wash Watershed where the road density might increase by 0.67 mi/mi^2 within 300 feet of perennial waterways. Additionally, agency stipulations for the affected BLM Fos and USFS-administered lands require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 139 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative Variation in Region II

Emma Park Alternative Variation

Table 3.4-12 shows the water resource impact parameters associated with the Emma Park Alternative Variation and the comparable portion of Alternative II-F. This variation would require an increased number of stream crossings, increased water use, and increased ground disturbance when compared with the portion of Alternative II-F it would replace.

Table 3.4-12 Summary of Region II Alternative Variation Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide	Water Use (acre-feet)	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canals	Reservoir/Lakes	Impaired				
Emma Park Alternative Variation	26	10	16	0	0	0	0	26	645	221
Comparable Portion of II-F	17	2	15	0	0	0	0	24	666	240

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Alternative Connectors in Region II

Table 3.4-13 summarizes impacts associated with the alternative connectors in Region II. The Lynndyl Alternative Connector would include an increase in total waterbodies crossed, disturbed areas, and water use. The IPP Alternative Connector would include minor increases to water use and disturbance primarily due to its short length.

Table 3.4-13 Summary of Region II Alternative Connector Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use (acre-feet)[1]	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canals	Reservoirs/Lakes	Impaired				
Castle Dale Alternative Connector	16	0	14	2	0	0	0	15	176	50
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									
Price Alternative Connector	33	4	29	0	0	0	0	23	280	81
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									
Lynndyl Alternative Connector	45	0	33	12	0	0	0	25	305	72
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									
IPP East Alternative Connector	0	0	0	0	0	0	0	3	36	7
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									
Highway 191 Alternative Connector	9	3	6	0	0	0	0	4	119	38
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Region II Conclusion

Alternatives II-A, II-D, and II-F all have similar impacts to water resources, which are less than the remaining alternatives. Alternatives II-B, II-C, and II-E would have a greater number of stream crossings listed for impaired water quality (without existing crossings nearby) and the largest increases to road densities in certain watersheds, which indicate that increased impacts to these streams would be likely. These alternatives also are longer in length, which equates to more ground disturbance and stream crossings. Alternatives II-B and II-C are 30 to 40 percent longer than Alternatives II-A, II-D, II-E, and II-F, which equates to increased crossings, ground disturbance, and water use.

3.4.6.6 Region III

Table 3.4-14 provides a tabulation of impacts associated with the alternative routes in Region III. Key impact parameters relate to the impact discussion in Section 3.4.6.2, Impacts Common to all Alternative Routes and Associated Components. Changes to road density within the affected watersheds (HUC10) are tabulated in **Table 3.4-15**. Specific differences by alternative are discussed below. No streams with impairments for sediment or physical alterations are crossed by alternatives in Region III.

Table 3.4-14 Summary of Region III Alternative Route Impact Parameters

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Waterbody Crossings (count)			
Total	535	449	515
Perennial	3	5	0
Intermittent	511	421	491
Canals	17	20	21
Reservoirs/Lakes	4	3	3
Impaired	2	1	0
Springs/Seeps in 2-mile transmission line corridor	16	9	10
Floodplains over 1,000 feet wide (count)	2	2	2
Water Use (acre-feet)[1]	206	212	230
Construction Disturbance (acres)	3,641	3,593	3,926
Operation Disturbance (acres)	996	875	953

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Alternative III-A (Applicant Proposed)

Key Parameters Summary

Alternative III-A would entail the crossing of three perennial streams, two of which are impaired. Pinto Creek is listed because of observed bio-toxicity, and the Muddy River is impaired due to elevated iron, temperature, and boron. Existing crossings of these waterways are located within several miles of the proposed new crossings and would be utilized according to mitigation measure **WR-1**. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative III-A generally increases no more than 0.1 mi/mi^2, with exceptions in 8 watersheds where the highest increase in road density of 1.61 mi/mi^2 was calculated within the 100-foot perennial buffer of The Big Wash-Beaver River Watershed. Additionally, agency stipulations for the affected BLM FOs and USFS-administered

Table 3.4-15 Summary of Road Density Changes by Watershed (HUC10) in Region III

Watershed Name	HUC10	Existing Density (mi/mi^2)			Alternative II-A Added Density (mi/mi^2)			Alternative II-B Added Density (mi/mi^2)			Alternative II-C Added Density (mi/mi^2)		
		100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC
California Wash	1501001207	0	0	0.73	0	0	0.14	0	0	0.09			
Cathedral Gorge-Meadow Valley Wash	1501001306	5.05	4.66	1.40							0	0	0.11
Clover Creek	1501001305	7.75	5.63	0.82				0	0	0.08			
Delamar Valley	1606000910	0	4.06	0.93							0	0	0.09
Dry Lake Valley	1501001206	0	0	0.73				0	0	0.04	0	0	0.15
Dry Lake Valley	1606000909	0	0	0.97							0	0	0.03
Elbow Canyon	1501001204	0	0	0.19							0	0	0.10
Escalante Valley-Pinto Creek	1603000614	5.21	5.35	1.59	0	0	0.07	0	0	0.02	0	0	0.02
Fisher's Wash	1603000607	2.97	5.89	1.60	0	0	0.06	0	0	0.06	0	0	0.06
Fourmile Wash-Frontal Lund Flats	1603000606	19.86	9.24	1.54	0	0	0.01	0	0	0.06	0	0	0.06
Garden Wash	1501001004	0	0	0.91				0	0	0.16			
Gold Springs Wash	1603000610	0.68	2.53	1.17				0	0	0.08	0	0	0.11
Government Wash-Colorado River	1501000512	0.05	0.12	1.09	0	0	0.02	0	0	0.02	0	0	0.01
Halfway Wash-Virgin River	1501001007	0.04	0.33	0.83	0	0	0.05	0	0	0.03			
Hog Back Reservoir-Old River Bed	1603000510	0	0.70	1.13	0	0	0.02	0	0	0.02	0	0	0.02
Iron Springs Creek-Frontal Lund Flats	1603000605	4.24	5.54	2.14	0	0	0.05	0	0	0.03	0	0	0.03
Kane Springs Wash	1501001201	0	1.10	0.61							0	0	0.01
Kershaw Canyon-Meadow Valley Wash	1501001307	6.88	7.74	0.66							0	0	0.02
Long Lick Canyon-Big Wash	1603000703	1.05	2.58	2.13	0	0	0.08	0	0	0.08	0	0	0.08
Lower Beaver Dam Wash	1501001002	0.96	1.40	0.80	0.19	0.20	0.04	0.33	0.33	0.05			
Lower Beaver River	1603000805	0	0	1.30							0	0	0.13
Lower Meadow Valley Wash	1501001309	0.38	1.00	0.31				0.31	0.36	0.01			
Lower Muddy River	1501001209	1.70	2.80	1.03	0.11	0.23	0.10	0	0	0.06			
Lower Santa Clara River	1501000808	2.91	4.43	2.00	0	0	0.05						
Lower Sevier River	1603000517	1.64	2.64	1.56	0	0	0.10	0	0	0.10	0	0.16	0.09
McDonald Wash-Negro Liza Wash	1603000612	2.25	2.58	1.27				0	0	0.09	0	0	0.09

Table 3.4-15 Summary of Road Density Changes by Watershed (HUC10) in Region III

Watershed Name	HUC10	Existing Density (mi/mi^2)			Alternative II-A Added Density (mi/mi^2)			Alternative II-B Added Density (mi/mi^2)			Alternative II-C Added Density (mi/mi^2)		
		100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC
Middle Pahranagat Wash	1501001203	0	0	0.36							0	0	0.11
Moody Wash	1501000806	2.09	3.02	1.46	0	0	0.19						
Morehouse Canyon-Beaver River	1603000707	0	0	1.44	0	0	0.11	0	0	0.11	0	0	0.11
Mountain Spring Wash	1603000609	2.88	6.16	1.30				0	0	0.02	0	0	0.02
Mud Spring Wash	1603000608	4.32	5.06	1.87	0	0	0.02	0	0	0.01	0	0	0.01
Nellis Air Force Base	1501001504	19.43	17.07	3.39							0	0	0.01
Pahranagat Creek	1501001116	1.67	2.31	0.80							0	0	0.03
Picture Rock Wash	1603000509	1.01	1.31	1.30	0	0	0.04	0	0	0.04	0	0	0.04
Red Rock Wash	1606000908	3.02	12.08	0.83							0	0	0.16
Sand Hollow Wash-Virgin River	1501001006	0.68	0.93	1.56	0	0	0.03						
Shoal Creek	1603000613	6.98	7.39	1.80	0.28	0.64	0.08						
Soap Hollow	1603000516	3.42	11.86	1.22	0	0	0.01	0	0	0.01			
Swasey Wash	1603000511	8.26	7.62	0.89	0	0	0.01	0	0	0.01	0	0	0.01
The Big Wash-Beaver River	1603000706	1.89	2.73	2.39	1.61	0.76	0.06	1.61	0.76	0.06	1.61	0.76	0.06
Toquop Wash	1501001005	5.07	3.74	0.57	0	0	0.09	0	0	0.10			
Upper Beaver Dam Wash	1501001001	5.62	3.39	0.95	0	0	0.07						
Upper Beaver River	1603000803	6.16	7.02	1.41	0	0	0.13	0	0	0.13	0	0	0.12
Upper Muddy River	1501001208	2.90	3.00	1.01	0	0	0.03	0.07	0.09	0.05			
Upper Pahranagat Wash	1501001202	0	3.73	0.27							0	0	0.09
Upper Santa Clara River	1501000807	1.82	2.65	1.56	0	0	0.06						

Notes: Road density is reported as miles of road divided by square miles of area. Blanks indicate watershed is not affected by the alternative.

100 feet: area of watershed within 100 feet of a perennial waterway; 300 feet: area of watershed within 300 feet of a perennial waterway; HUC 10: entire HUC 10 Watershed area.

Sources: NRCS et al. 2010; U.S. Census Bureau 2010.

lands require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 206 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative III-B (Agency Preferred)

Key Parameters Summary

Alternative III-B would entail the crossing of five perennial streams, one of which is impaired. The Muddy River is impaired due to elevated iron, phosphate, temperature, and decreased dissolved oxygen. Existing crossings of the Muddy River are within 1 mile and would be utilized according to mitigation measure **WR-1**. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative III-B generally increases no more than 0.1 mi/mi^2, with exceptions in 6 watersheds where the highest increase in road density of 1.61 mi/mi^2 was calculated within the 100-foot perennial buffer of the Big Wash–Beaver River Watershed. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 212 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative III-C

Key Parameters Summary

Alternative III-C would not entail crossing perennial streams, and no impaired streams would be crossed. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative III-C generally increases no more than 0.1 mi/mi^2, with exceptions in 8 watersheds where the highest increase in road density of 1.61 mi/mi^2 was calculated within the 100-foot perennial buffer of the Big Wash-Beaver River Watershed. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 230 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative Variations in Region III

Table 3.4-16 provides a comparison of impacts associated with the alternative variations in Region III. Each of the alternative variations in Region III would require increased water use and disturbance areas when compared with the corresponding portion of the alternative route they would replace. Ox Valley East Alternative Variation would slightly reduce total waterbody crossings; Ox Valley West Alternative Variation and Pinto Alternative Variations would slightly increase total waterbody crossings. Both Ox Valley variations would reduce perennial stream crossings when compared with the corresponding portion of the alternative route they would replace.

Alternative Connectors in Region III

Table 3.4-17 summarizes impacts associated with the alternative connectors in Region III. The Moapa Alternative Connector would include an increase in total waterbodies crossed, disturbed areas, and water use.

Table 3.4-16 Summary of Region III Alternative Variation Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use (acre-feet)[1]	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canals	Reservoirs/Lakes	Impaired				
Ox Valley East Alternative Variation	30	1	29	0	0	0	0	26	276	100
Comparable portion of III-A	33	2	30	0	1	0	0	25	252	95
Ox Valley West Alternative Variation	34	1	33	0	0	0	0	26	268	100
Comparable portion of III-A	33	2	30	0	1	0	0	25	252	95
Pinto Alternative Variation	64	7	57	0	0	4	0	34	449	111
Comparable portion of III-A	62	2	57	2	1	1	0	35	381	125

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Table 3.4-17 Summary of Region III Alternative Connector Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use (acre-feet)[1]	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canals	Reservoirs/Lakes	Impaired				
Avon Alternative Connector	0	None					0	8	104	21
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									
Moapa Alternative Connector	27	0	27	0	0	0	0	13	168	34
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Alternative Ground Electrode Systems in Region III

It would be necessary to locate the southern ground electrode system within 100 miles of the Southern Terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by TWE. The impacts associated with constructing and operating this system are the same as those discussed in Section 3.4.6.2, Impacts Common to all Alternative Routes and Associated Components. **Table 3.4-18** summarizes impacts associated with the seven combinations of alternative routing and locations possible for a southern ground electrode system.

Region III Conclusion

Impacts to water resources from the alternatives in Region III are all relatively similar. Alternative III-B would require the least number of stream crossings. Considering design features, stipulations, BMPs, and mitigation measures, impacts to water resources would be expected to be minor.

Table 3.4-18 Summary of Region III Alternative Ground Electrode System Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use[1] (acre-feet)	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canals	Reservoirs/Lakes	Impaired				
Mormon Mesa-Carp Elgin Rd (Alternative III-A)	12	0	4	0	8	0	0	4	91	19
Halfway Wash-Virgin River (Alternative III-A)	3	0	3	0	0	0	0	3	84	16
Halfway Wash East (Alternative III-A)	12	0	12	0	0	0	0	6	104	26
Mormon Mesa-Carp Elgin Rd (Alternative III-B)	13	0	5	0	8	0	0	6	103	26
Halfway Wash-Virgin River (Alternative III-B)	3	0	3	0	0	0	0	4	93	20
Halfway Wash East (Alternative III-B)	1	0	1	0	0	0	0	6	102	25
Meadow Valley 2 (Alternative III-C)	27	0	27	0	0	0	0	16	174	66
Delta (Design Option 2)	16	0	16	0	0	0	0	14	160	50

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

3.4.6.7 Region IV

Table 3.4-19 provides a tabulation of impacts associated with the alternative routes in Region IV. Key impact parameters relate to the impact discussion in Section 3.4.6.2, Impacts Common to all Alternative Routes and Associated Components. Changes to road density within the affected watersheds (HUC10) are tabulated in **Table 3.4-20**. Specific differences by alternative are discussed below. No streams with impairments for sediment or physical alterations are crossed by alternatives in Region IV.

Table 3.4-19 Summary of Region IV Alternative Route Impact Parameters

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Waterbody Crossings (count)			
Total	67	56	55
Perennial	1	3	2
Intermittent	65	48	49
Canals	1	5	4
Reservoirs/Lakes	0	0	0
Impaired	1	1	1
Springs/Seeps in 2-mile transmission line corridor	0	0	0
Floodplains over 1,000 feet wide (count)	0	0	0
Water Use (acre-feet)	29	30	32
Construction Disturbance (acres)	566	573	663
Operation Disturbance (acres)	148	180	182

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Table 3.4-20 Summary of Road Density Changes by Watershed (HUC10) in Region IV

Watershed Name	HUC10	Existing Density (mi/mi^2)			Alternative II-A Added Density (mi/mi^2)			Alternative II-B Added Density (mi/mi^2)			Alternative II-C Added Density (mi/mi^2)		
		100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC	100 feet	300 feet	HUC
Duck Creek-Las Vegas Wash	1501001507	2.93	4.39	6.54	0.16	0.09	0.07						
Eldorado Valley	1606001518	0.61	1.85	1.28	0	0	0.06	0	0	0.08	0	0	0.10
Government Wash-Colorado River	1501000512	0.05	0.12	1.09	0	0	0.11	0	0	0.18	0	0	0.18
Gypsum Wash-Colorado River	1501000513	0.03	0.05	0.38				0	0.01	0.06	0	0.01	0.04
Jumbo Wash-Colorado River	1503010101	0.06	0.14	0.56							0	0	0.01

Note: Road density is reported as miles of road divided by square miles of area. Blanks indicate watershed is not affected by the alternative.

100 feet: area of watershed within 100 feet of a perennial waterway; 300 feet: area of watershed within 300 feet of a perennial waterway; HUC 10: entire HUC 10 Watershed area.

Sources: US Census Bureau 2010, NRCS et al. 2010

Alternative IV-A (Applicant Proposed and Agency Preferred)

Key Parameters Summary

Alternative IV-A would entail the crossing of one perennial stream that is impaired. Las Vegas Wash is impaired due to elevated iron and molybdenum. A TMDL has been established to limit phosphorus, ammonia, and chlorophyll-a. Construction of crossings in this wash would be avoided by utilization of existing crossings in the area. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative IV-A increases no more than 0.16 mi/mi^2. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 29 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative IV-B

Key Parameters Summary

Alternative IV-B would entail the crossing of three perennial streams, one of which is impaired. Las Vegas Wash is impaired due to elevated iron and molybdenum. A TMDL has been established to limit phosphorous, ammonia, and chlorophyll-a. Construction of crossings in this wash would be avoided by utilization of existing crossings in the area. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative IV-B increases no more than 0.18 mi/mi^2. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 30 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative IV-C

Key Parameters Summary

Alternative IV-C would entail the crossing of two perennial streams, one of which is impaired. Las Vegas Wash is impaired due to elevated iron and molybdenum. A TMDL has been established to limit phosphorous, ammonia, and chlorophyll-a. Construction of crossings in this wash would be avoided by utilization of existing crossings in the area. Through the implementation of applicant-committed design features, agency BMPs, and mitigation measures **WR-1** and **WR-2**, impacts to water quality from stream crossings would be minimized to include only the potential for unstable streambanks to contribute sediment to streams. Although other factors contribute to erosion and sediment yield in upland areas (e.g., soil type, vegetative cover, slope), an increased contribution of sediment would be expected relative to the amount of construction and operation disturbance, and relative to the increase in road density especially near perennial waterways. Road density due to Alternative IV-C increases no more than 0.18 mi/mi^2. Additionally, agency stipulations in the affected BLM FOs require the avoidance of areas near perennial waterways (see **Appendix C**). Water use would require 32 acre-feet of water. Water would be supplied through arrangements with existing water rights holders and temporary use permits, subject to

review and approval by the appropriate state. No new withdrawals would be required, and no effects on other water users would be anticipated.

Alternative Variations in Region IV

Table 3.4-21 provides a comparison of impacts associated with the alternative variation in Region IV. The Marketplace Alternative Variation would not cross any waterbodies, nor would the corresponding portion of the alternative route (Alternative IV-B) it would replace. The same comparison shows a slight increase in disturbance area and water use if the variation were constructed.

Table 3.4-21 Summary of Region IV Alternative Variation Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use (acre-feet)[1]	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canals	Reservoirs/Lakes	Impaired				
Marketplace Alt. Variation	0	0	0	0	0	0	0	8	109	21
Comparable portion of IV-B	0	0	0	0	0	0	0	7	82	19

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Alternative Connectors in Region IV

Table 3.4-22 tabulates impacts associated with the alternative connectors in Region IV. Each alternative connector would increase the total number of waterbodies crossed, disturbed areas, and amount of water used.

Table 3.4-22 Summary of Region IV Alternative Connector Impact Parameters

	Waterbody Crossings (count)						Floodplains over 1,000 feet wide (count)	Water Use (acre-feet)[1]	Construction Disturbance (acres)	Operation Disturbance (acres)
	Total	Perennial	Intermittent	Canals	Reservoirs/Lakes	Impaired				
Sunrise Mountain Alt. Connector	4	0	4	0	0	0	0	3	38	8
Conclusion	This connector could be utilized through numerous combinations to avoid crossing the impaired reach of Las Vegas Wash. There are no apparent unique constraints for water resources by utilizing this connector.									
Lake Las Vegas Alt. Connector	9	0	8	1	0	0	0	5	54	19
Conclusion	This connector could be utilized through numerous combinations to avoid crossing the impaired reach of Las Vegas Wash. There are no apparent unique constraints for water resources by utilizing this connector.									
Three Kids Mine Alt. Connector	8	0	8	0	0	0	0	9	93	34
Conclusion	This connector could be utilized through numerous combinations to avoid crossing the impaired reach of Las Vegas Wash. There are no apparent unique constraints for water resources by utilizing this connector.									
River Mountains Alt. Connector	10	1	8	1	0	0	0	14	142	57
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									
Railroad Pass Alt. Connector	4	0	4	0	0	0	0	4	58	14
Conclusion	There are no apparent unique opportunities or constraints for water resources by utilizing this connector.									

[1] Estimation of water use based on assumptions provided for construction of a 600-kV DC transmission line.

Region IV Conclusion

Impacts to water resources in Region IV are relatively similar. Alternative IV-A has more stream crossings; however, the development in the area would provide opportunities for use of existing crossings. Water use and construction disturbance show no appreciable differences among the alternatives. Considering design features, stipulations, BMPs, and mitigation measures, impacts to water resources would be expected to be minor.

3.4.6.8 Residual Impacts

Mitigation measures are designed to identify and reduce impacts to water resources but do not fully eliminate those impacts. The Project would result in the potential for site-specific increases of upland erosion during construction, thereby increasing sedimentation to streams. This impact would decrease with successful reclamation; however, some continued increases in sedimentation would be expected in areas with poor or low reclamation potential during operation due to the continued use of constructed roads.

3.4.6.9 Impacts from the No Action Alternative

Current management across the analysis area would be maintained under the No Action alternative. Under this alternative, there would be no Project construction, operation, or maintenance disturbance to impact water quality or water use. There would be no Project construction, operation, or maintenance equipment or infrastructure in the area to cause hazardous material spills.

3.4.6.10 Irreversible and Irretrievable Commitment of Resources

Irreversible impacts to surface water are not anticipated since environmental measures, including reclamation, would mitigate effects on water quantity and quality over time. Temporary reductions in water quality from erosion and sedimentation would be irretrievable.

Water consumptively used during the project would be irretrievable. However, this would not be irreversible because the water uses would end after construction of the Project.

3.4.6.11 Relationship Between Local Short-term Uses and Long-term Productivity

Increases in erosion and decreases in streamside bank vegetation during construction could potentially impact channel stability beyond the construction phase of the Project. If reclamation is effectively implemented, this would not impact the long-term productivity of the streams.

TransWest Express Transmission Project

Draft

Environmental Impact Statement

(Volume II)

BLM

Wyoming State Office

June 2013

Western AREA POWER ADMINISTRATION

Mission Statement

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

Mission Statement

Western is a Federal agency under the Department of Energy that markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states. Western's mission: Market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services.

BLM/WY/PL-13/021+5101

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3.5 Vegetation

3.5.1 Regulatory Background

Regulations that directly influence vegetation resources within the analysis area are primarily implemented by the BLM, USFS, Department of Agriculture for Wyoming, Colorado, Utah, and Nevada, and the USACE. The vegetation regulations, including those regulations for noxious weed management, riparian and wetland areas, relevant to the project are presented in **Table 3.5-1**.

Table 3.5-1 Relevant Regulations for Vegetation Resources

Topic	Regulation
Noxious and Invasive Weeds	Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974) 7 United States Code SS 2801-2814 Colorado Revised Statutes 35-5.5-104.5 to 35-5.5-119; 25-8-205; 25-8-205.5; 35-9-118 Colorado Code of Regulations 8 CCR 1206-2 Wyoming Statutes 11- 5- 102.a.xi Wyoming Weed and Pest Control Act Utah Code 04-17-1 to 04-17-11 Utah Administrative Code Rules 68-9 Nevada Revised Statutes 555.005-555.5570 FSM 2000 Zero Code 2080
Riparian and Wetlands	Clean Water Act (33 USC 1344) Rivers and Harbors Act (33 USC 401 et seq.) Code of Federal Regulations Title 33 Navigation and Navigable Waters Executive Order 11988, “Floodplain Management,” May 24, 1977 Executive Order 11990, “Protection of Wetlands,” May 24, 1977 Colorado Code of Regulations 5-CCR 1002-31 Wyoming Wetland Act W.S. 35-11-308 through 35-11-311 BLM Utah Riparian Policy (IM-UT-2005-091)

3.5.1.1 Noxious and Invasive Weed Species

The terms “noxious weed” and “invasive weed” are often used interchangeably to describe any plant that is unwanted and grows or spreads aggressively. The term “noxious weed” is legally defined under both Federal and state laws. Under the Federal Plant Protection Act of 2000, a noxious weed is defined as “any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the U.S., the public health, or the environment” (Animal and Plant Health Inspection Service 2000; Institute of Public Law 1994). Invasive species are defined as plants able to establish on a site where they were not present in the original plant composition (BLM 2008). The Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974) and EO 13112 of February 3, 1999, require cooperation with state, local, and other federal agencies in the application and enforcement of all laws and regulations relating to the management and control of noxious weeds.

The BLM has established a goal that NEPA documents consider and analyze the potential for the spread of noxious weed species and provide preventative rehabilitation measures for each management action involving surface disturbance. The USFS regulates noxious weeds as required in the USFS FSM 2000 zero code 2080. BLM and USFS BMPs and Stipulations and Guidelines, as defined in the RMPs and LRMPs, list requirements for noxious weed control and management. In addition to the Federal noxious weed list, each

state maintains a list of regulated and prohibited noxious and invasive weed species. Weed control and management is typically required in each county on public and private lands. Counties also can have their own list of regulated and prohibited invasive weed species. For the land management agencies, while the primary concern is the control of noxious weeds of concern identified by the State statutes and regulations in Wyoming, Colorado, Utah, and Nevada, a secondary concern is the control of invasive species (e.g., halogeton, henbane, and cheatgrass). The following paragraphs outline the management and regulatory requirements by state.

Wyoming

The Wyoming Department of Agriculture defines noxious weeds as "weeds, seeds, or other plant parts that are considered detrimental, destructive, injurious or poisonous, either by virtue of their direct effect or as carriers of diseases or parasites that exist within the state, and are on the designated list (by the Wyoming Statutes" (Title 11, Chapter 5, Section 102.a.xi).

Colorado

The Colorado Department of Agriculture (CDA) manages and regulates noxious and invasive species through the Colorado Noxious Weed Act, which classifies noxious weeds into three lists, A, B, and C (§ 35 5.5-101 through 119, C.R.S. [2003]). Each list has specific control requirements, with the most stringent requirements for those species found on List A. List A species are designated for eradication. List B includes species for which state noxious weed management plans would be developed to stop the continued spread of these species. List C includes species for which state noxious weed management plans would be developed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands (CDA 2011).

Utah

The Utah Department of Agriculture (UDA) defines a "noxious weed" as any plant especially injurious to public health, crops, livestock, land, or other property per the Utah Noxious Weed Act, which classifies noxious weeds into three non-native classes: Class A (Early Detection Rapid Response [EDRR]), Class B (Control), and Class C (Containment). Class A species pose a serious threat to the state and should be considered a very high priority for EDRR. Class B species pose a threat to the state and should be considered a high priority for control. Class C species are widely spread and pose a threat to agricultural industry with a focus on stopping expansion (Utah Weed Control Association 2011).

Nevada

The State of Nevada defines noxious weeds as "any species of plant which is liable to be detrimental or destructive and difficult to control or eradicate" (NRS 555.010-555.220). The state has enacted laws requiring the control of noxious weed species (NRS 555.005, NAC 555.010) for which the Nevada Department of Agriculture (NDA) maintains jurisdiction, management, and enforcement. Under NRS 555.010-555.220 and per the NDA, state-listed noxious weeds are classified into three categories: A, B, and C. Each list has specific control requirements, with the most stringent requirements for those species found in Category A. Category A includes noxious weed species not found or limited in distribution throughout the state, actively excluded from the state, and actively eradicated wherever found, and whose control is required by the state for all infestations. Category B includes noxious weed species which are established in scattered populations in some counties of the state, actively excluded where possible, and whose control is required by the state in areas where populations are not well established or not previously known to occur. Category C includes noxious weed species currently established and generally widespread in many counties of the state, and whose abatement remains at the discretion of the State Quarantine Officer (NDA 2010).

3.5.1.2 Riparian and Wetland Areas

Waters of the U.S. (WUS) are defined in 33 CFR 328.3 as all non-tidal waters that are currently, or were used in the past, or may be susceptible to use in interstate commerce; all interstate waters including wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, of which the use, degradation or destruction could affect interstate commerce; and all impoundments of waters otherwise defined as WUS under this definition. In addition, tributaries of the above listed waters, including arroyos and other intermittent drainages, and wetlands adjacent to the above waters also are considered to be WUS.

Criteria used by the USACE to determine whether a drainage constitutes a WUS include presence of a defined bed, banks, or evidence of an ordinary high water mark.

Wetlands adjacent to other WUS, such as streams, also are considered to be WUS. In addition, and as used herein, the term “wetlands” has a regulatory definition as defined in 33 CFR 328. 7(b) as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Note that the frequency and duration of saturation may vary by geographical region, and is largely dependent upon local climatic conditions.

According to the USACE’s 1987 Wetland Delineation Manual, a “three-parameter” approach is required for delineating USACE-defined wetlands (USACE 1987), where areas are identified as wetlands if they exhibit hydrophytic vegetation, hydric soils, and wetland hydrology.

The BLM defines a riparian area as “an area of land that is directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and stream banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil” (BLM 2008 [Richfield RMP/EIS]). The USFS defines riparian areas as “Geographically delineable areas of land directly influenced by water, comprised of the aquatic and riparian ecosystems. Riparian ecosystems occupy the transition between the aquatic and adjacent terrestrial ecosystem and are characterized by distinctive vegetation communities that require free or unbound water” (USFS 1986a,b). Wetland and riparian communities typically have persistent water or obligate vegetation (e.g., sedges, rushes, willows) due to the availability of surface or groundwater.

3.5.1.3 Wildland Fire

Wildland fire is managed by the governing agency's policies through the RMPs or Land Use Plans (LUPs) and corresponding Fire Management Plans (FMPs) for each of the agencies office or fire management organization. The State Agencies also have their own process and policies for managing wildland fire that are set in their state statues delegating the authority to specific organizations within the each state on down to the county level. The National Wildfire Coordinating Group (NWCG) is an operational group designed to coordinate programs of participating wildfire management agencies, which include the BLM, USFS, NPS, USFWS, and BIA. Federal fire regulations are based on the *Federal Wildland Fire Management Policy* (1995) and the *Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDOI and USDA 2001, 1995).

The analysis for vegetation contained in this EIS assumes that the BLM will continue to manage vegetation resources, noxious weeds, riparian and wetland areas, and wildland fires in coordination with the USFS, USACE, and applicable state agencies (i.e., WDA, CDA, UDA, and NDA). The USFWS will continue to have jurisdiction over the management of ESA-listed plant species.

3.5.2 Data Sources

Information regarding vegetation resources within the analysis area was obtained from a review of existing published sources; BLM RMPs; USFS LRMPs; and WYNDD, CNHP, UNHP, and NNHP database information. Vegetation communities, including riparian and wetland areas, and acreages were identified using the Southwest Regional Gap Analysis Project (SWReGAP) and Northwest Regional Gap Analysis Project (NWReGAP) land cover data (USGS 2008, 2004). Vegetation community characterizations were compiled based on SWReGAP Land Cover descriptions (USGS 2005), NWReGAP Land Cover Descriptions (NatureServe 2012), BLM RMPs, and USFS LRMPs. Species nomenclature is consistent with the NRCS PLANTS Database (NRCS 2013) unless otherwise specified. Noxious weed regulated species were obtained from state statues and supplemented by information provided on state websites.

3.5.3 Analysis Area

The analysis area for vegetation encompasses the total area within the HUC 10 watershed boundaries (as defined in Section 3.4.3) crossed by the 2-mile transmission line corridors for all alternatives and locations of other project components including terminals and ground electrode sites.

3.5.4 Baseline Description

3.5.4.1 Vegetation

The analysis area crosses a range of vegetation types in several ecoregions. Ecoregions are areas where the ecosystems, and the type, quality, and quantity of environmental resources are generally similar as defined by the analysis of patterns and composition of biotic and abiotic phenomena including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology (USEPA 2013). The USEPA has mapped ecoregions at various scales for North America, with the coarsest scale labeled as Level I and the most detailed as Level IV. For this analysis, the Level III ecoregions provide sufficient detail at a broad enough scale to discuss the various ecosystems crossed by the analysis area. The following five Level III ecoregions cover the analysis area: the Wyoming Basin, the Colorado Plateau, the Wasatch and Uinta Mountains, the Central Basin and Range, and the Mojave Basin and Range (USEPA 2013). Climate and precipitation throughout the analysis area are covered in Section 3.1, Climate and Air Quality, while topography, physiographic regions, and range of elevations are discussed in Section 3.2, Geological, Paleontological, and Mineral Resources. Soils and land uses within the analysis area are presented in Section 3.3, Soil Resources, and Section 3.14, Land Use, respectively.

The Wyoming Basin is a broad, arid basin drained by the Green and North Platte rivers within the analysis area. Surrounded by mountains, the basin is dominated by grasslands and shrublands (Chapman et al. 2004). The arid uplifted, eroded, and deeply dissected tableland of the Colorado Plateau is crossed by the Green and Colorado rivers within the analysis area. The vegetation is sparse and predominately composed of dwarf shrubs in the low-elevation basins and canyons, whereas in the uplands and higher valleys, shrublands and pinyon-juniper woodlands are common. The Wasatch and Uinta Mountain region includes the Uinta Mountains, Wasatch Range, and Wasatch Plateau. The vegetation communities tend to group along elevation bands, with grasslands and shrublands common in the low elevations, mixed, ponderosa, and pinyon-juniper forests in the low to middle elevations, and fir, spruce, pine, and aspen species in the forested communities in the middle to high elevations. In the highest elevations, the vegetation tends to be small, low stature, alpine shrub and forb species, with stunted spruce, fir and pine trees. The Central Basin and Range ecoregion is composed of elevated, internally drained xeric basins in between scattered mountain ranges (Bryce et al. 2003). The vegetation is a mosaic of sagebrush or saltbush-greasewood shrublands and salt flats. The Mojave Basin and Range found in southern Nevada and southwestern Utah is sparsely vegetated, dominated by desert shrubs such as creosote bush, white bursage, Joshua-tree, yucca species, and blackbrush. Tree species are found in the higher elevations and include juniper, singleleaf pinyon, ponderosa pine, white fir, limber pine, and bristlecone pine.

The SWReGAP land cover type categories have been grouped into 21 associated vegetation communities, which are further grouped into eight land cover types. The land cover and associated vegetation communities, and their spatial extent within the analysis area, are listed in **Table 3.5-2**. Descriptions of the plant communities for each land cover and associated vegetation communities are provided in the following text.

Table 3.5-2 Vegetation Cover and Land Use Types within the Analysis Area[1]

Land Cover Types	Vegetative Communities Associated with Land Cover Types	Extent within Analysis Area (acres)
Agriculture	Cultivated Crop and Pasture	784,433
Barren Areas	Barren/Sparsely Vegetated	321,697
	Cliff and Canyon	816,392
	Dunes	133,157
Developed/Disturbed	Developed/Disturbed	988,126
Forest and Woodlands	Aspen Forest and Woodland	641,483
	Conifer Forest	539,604
	Deciduous Forest	13,933
	Pinyon-Juniper	4,081,539
Grasslands	Grassland	1,537,916
	Montane Grassland	70,313
	Tundra	13,956
Greasewood Flat	Greasewood Flat	875,991
Riparian and Wetlands	Open Water	154,328
	Herbaceous Wetland	188,239
	Riparian	68,489
	Woody Riparian and Wetlands	214,144
Shrubland	Desert Shrub	3,074,124
	Saltbush Shrubland	2,991,796
	Sagebrush Shrubland	6,539,728
	Montane Shrubland	875,292
Total		**24,924,680**

[1] The analysis area includes the HUC 10 watershed boundaries crossed by the 2-mile transmission line corridors and associated facilities.

The agriculture cover type consists of 3 percent of the analysis area and is composed of agriculture lands, cultivated cropland and pasture and hay fields. For additional details of agriculture within the analysis area, see Section 3.14, Land Use.

The barren areas cover type is found in 5 percent of the analysis area, and encompasses three vegetative communities including barren and sparsely vegetated areas, cliff and canyons, and active and stabilized dunes. Barren and sparsely vegetated areas within the analysis area typically have less than 10 percent vegetative cover usually consisting of dwarf shrubs. In the analysis area, these areas are composed of shale badlands in Wyoming, Colorado, and Utah; desert pavements and badlands in Nevada; areas composed of volcanic rock in Utah and Nevada; and scree and bedrock areas in the alpine areas of Utah. Cliff and canyon areas are found throughout the analysis area, but are most common in Utah and Nevada. The cliff and canyon vegetation community is comprised of barren and sparsely vegetated landscapes such as steep cliff faces, narrow canyons, small rock outcrops, and open tablelands of sandstone, shale, and limestone. The vegetation in cliff and canyon areas is characterized by very open tree canopy or scattered trees and shrubs with a sparse herbaceous layer. Common species can include conifers, montane and

desert short-shrub, succulents, and herbaceous species. Dunes are found in Wyoming and Utah on windswept mesas, broad basins and plains where the substrates are stabilized sandsheets or shallow to moderately deep sandy soils that form small hummocks or small coppice dunes. Typical dune vegetation is short shrubs with 10 to 30 percent cover.

The developed/disturbed cover type covers 4 percent of the analysis area and is found throughout the analysis area. Developed areas include urban and rural development, roads, utility corridors and stations, oil and gas development, mines, quarries, and recently burned and chained areas. The urban areas within the analysis area include several towns and subdivisions. For more information on developed areas within the analysis area, see Section 3.14, Land Use, and Section 3.17, Social and Economic Resources.

The forest and woodlands cover type comprises 21 percent of the analysis area and encompasses four vegetation communities including aspen forest and woodland, other deciduous forests, pinyon-juniper woodlands, and other conifer forests. Forest types and dominant tree species in each of these vegetation communities is a factor of elevation, slope, aspect, soil characteristics, and climate. Several of the forest types are commercially important as timber. Aspen forest and woodlands are found in montane and subalpine zones in areas with adequate moisture. The vegetation is dominated by stands of quaking aspen (*Populus tremuloides*), even though other tree species may be present. In the analysis area, aspen woodlands are typically found with mixed conifer forests of fir, pines, and Engelmann spruce. In many areas, the conifers are increasing in dominance in the aspen and mixed conifer woodlands due to pressures from livestock grazing and fire suppression (USGS 2005). Other deciduous forests in the analysis area are found in Wyoming and Utah, and consist of oaks (*Quercus* spp.), maples (*Acer* spp.), and boxelders (*Acer negundo*). In Wyoming, much of the deciduous woodlands have high vegetative tree canopy cover and establishment of invasive vegetation. Conifer forests are found throughout the analysis area, but are most common in Utah's mountainous areas. The dominant coniferous forest type in the analysis area is pinyon-juniper woodlands, which occupy 16 percent of the analysis area. Pinyon-juniper woodlands are located in Colorado Plateau's lower elevations, and the dry mountain ranges of the Great Basin region. Pinyon-juniper communities typically occur on warm, dry areas on mountain slopes, mesas, plateaus, and ridges. Dominant overstory species include singleleaf pinyon (*Pinus monophylla*), two needle pinyon (*Pinus edulis*), and Utah juniper (*Juniperus osteosperma*). Understory vegetation can be sparse shrubs or graminoids with species consisting of greenleaf manzanita (*Arctostaphylos patula*), basin big sagebrush (*Artemisia tridentata* spp. *tridentata*), mountain mahogany (*Cercocarpus* spp.), muttongrass (*Poa fendleriana*), and Idaho fescue (*Festuca idahoensis*). Understory forbs can include penstemons (*Penstemon* spp.) and Scarlet globemallow (*Sphaeralcea coccerea*). Other coniferous forests in the analysis area consist of areas dominated by one species such as ponderosa pine (*Pinus ponderosa*) and lodgepole (*Pinus contorta*) or mixed conifer forests such as spruce-fir, limber pine-bristlecone pine, and limber pine-juniper. These forests are found in foothills, montane, and subalpine environments on dry to mesic sites.

The grasslands cover type occupies 7 percent of the analysis area and encompasses three vegetation communities including grasslands, montane grasslands, and tundra. Grassland vegetation communities occupy a wide range of areas within the analysis area including swales, plains, plateaus, and flat to rolling uplands. Grassland compositions vary across the analysis area with mixed grass prairie occurring in Wyoming, juniper savanna in Colorado, and semi-desert grassland in Colorado, Utah, and Nevada. Throughout the analysis area, invasive noxious and non-native species occur in many of the grasslands. Common species that occur in this vegetation community include western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula)*, fescue (*Festuca* spp.), Indian ricegrass (*Achnatherum hymenoides*), blue grama *(Bouteloua gracilis*), needle-and-thread (*Hesperostipa comata*), muhly (*Muhlenbergia* spp.), and James' galleta (*Pleuraphis jamesii*). Montane grasslands are found within the analysis area in montane and subalpine areas predominantly in Utah. Dominant vegetation ranges from graminoids, specifically bunch grasses, to forbs. Dominant graminoid species include oatgrass (*Danthonia* spp.), fescue (*Festuca* spp.), slimstem muhly (*Muhlenbergia filiculmis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), while forb species include fleabane (*Erigeron* spp.), asters (*Asteraceae* spp.), and penstemons (*Penstemon* spp.). In the analysis area, the tundra vegetation community is found above treeline in mountainous regions in Utah. It typically is found on gentle to moderate slopes, flat ridges, valleys, and basins where the soil is relatively

stable and the water supply is fairly constant. Vegetation is low-growing, perennial graminoids, and forbs, with rhizomatous, sod-forming sedges as the dominant graminoids.

The greasewood flat cover type occupies 4 percent of the analysis area. Greasewood flats are found in all four states crossed by the analysis area. This vegetation community type is defined as a mixed wetland and upland land cover type. Based on the categorization used by NWReGAP and SWReGAP, greasewood flats are defined as a woody wetland. More detail about this vegetation community is provided below under Wetland and Riparian Areas.

The riparian and wetland cover type occupies 3 percent of the analysis area and encompasses four vegetation communities including open water, herbaceous wetlands, riparian, and woody riparian and wetlands. More detail about these vegetation communities are provided below under Wetland and Riparian Areas.

The shrubland cover type is the dominant land cover type within the analysis area, comprising 54 percent of the area. Vegetation communities associated with the shrublands cover type include sagebrush shrubland, montane shrubland, saltbush shrubland, and desert shrublands.

Sagebrush and saltbush shrublands are found predominantly in the northeast of the analysis area; montane shrublands in the mountainous regions of central Utah; while desert shrub communities dominant in the southwest portion of the analysis area. In the sagebrush shrubland communities, sagebrush (*Artemisia* spp.) species dominate. The dominant sagebrush species and cover varies with elevation, aspect, water availability, substrate, and disturbance regime. Disturbance regimes also can alter shrub cover with wildfires decreasing shrub cover, while heavy grazing and fire suppression can increase shrub dominance. Typical sagebrush species in the sagebrush shrubland vegetation community are the Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), mountain big sagebrush (*Artemisia tridentata* ssp*. vaseyana*), threetip sagebrush (*Artemisia tripartita*)*,* black sagebrush (*Artemisia nova*), and little sagebrush (*Artemisia arbuscula*). Other shrubs include shadscale saltbush (*Atriplex confertifolia*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), and fringed sage (*Artemisia frigida)*. Herbaceous species are typically less than 25 percent cover, and can include Idaho fescue (*Festuca idahoensis*), prairie junegrass (*Koeleria macrantha*), bluebunch wheatgrass, Sandberg bluegrass (*Poa secunda),* needle-and-thread (*Hesperostipa comata*), and Great Basin wildrye (*Elymus cinereus* var. *cinereus*).

Montane shrublands are found in the mountains, plateaus, foothills, canyons, and hills in all four states. In Wyoming, the montane shrublands are a minor component of the analysis area, and consist of mountain mahogany shrublands on ridges and steep slopes. In Colorado and Utah, the composition of montane shrublands is determined by aspect, climate, and water availability. Dominant species can include gambel oak (*Quercus gambelii*), serviceberry (*Amelanchier* spp.), antelope bitterbrush (*Purshia tridentata*), and mountain mahogany. In the more arid areas in the southwest portions of the analysis area, montane shrublands tend to occur in the transition areas between the Mojave, Sonoran, and northern Chihuahuan deserts where their composition consists of species that are fire-adapted, such as scrub oak (*Quercus* spp.) and ceanothus (*Ceanothus* spp.).

Salt-desert shrublands are found in Wyoming, Colorado, and Utah on lower elevation slopes, saline basins, alluvial slopes, and plains. The vegetation cover is characterized by an open to moderately dense shrubland dominated by shadscale, four-winged saltbush (*Atriplex canescens*), Wyoming big sagebrush, yellow rabbitbrush, rubber rabbitbrush, and Nevada jointfir (*Ephedra nevadensis*). The understory is comprised of herbaceous species such as galleta (*Hilaria jamesii*), Indian ricegrass, blue grama, western wheatgrass, primrose (*Camissonia* spp., *Oenothera* spp.), and annual buckwheat (*Eriogonum* spp.).

The desert shrub vegetation community is the dominant shrubland vegetation community in the southwest portion of the analysis area. It is found on benchlands, pediments, lower piedmont slopes, bajadas, broad valleys, and plains and low hills. The dominant vegetation is dependent on the surrounding vegetation

communities, region, climate, elevation, and substrate. Desert shrub vegetation communities can be quite variable with the vegetation of the Colorado Plateau region typically dominated by blackbrush (*Coleogyne ramosissima*) and mormon tea (*Ephedra viridis*), and the Mojave and Sonoran deserts dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). The shrub cover tends to be open, with a sparse herbaceous layer.

3.5.4.2 Noxious and Invasive Weeds

Noxious and invasive weeds have become a growing concern in the western U.S. as their spread has resulted in impacts to endangered native species, available forage for livestock and wildlife, and economic resources. Noxious and invasive species threaten native ecosystems and biological diversity based on their ability to increase in cover relative to surrounding vegetation and exclude native plants from an area. Noxious and invasive species readily establish and spread in recently disturbed areas, which can impede successful reclamation and impact management of livestock, wildlife, and human activities. State regulated and prohibited noxious and invasive weed species in Colorado, Utah, Wyoming, and Nevada are listed in **Appendix G**.

3.5.4.3 Wetlands and Riparian Areas

Riparian and wetland areas comprise a small percentage of the lands in the West, but their importance to the surrounding ecosystems and associated species is disproportionately great. Most wildlife species use riparian areas at some point in their life cycles (e.g., many migratory birds during breeding and migration seasons), and some depend almost entirely on these systems (e.g., amphibians). Wetlands and riparian areas are often rich in vegetation diversity and structure, providing food, water, shade, and cover to wildlife and livestock, in addition to acting as water purifiers, supplying groundwater recharge, and aiding in flood control.

Wetland and riparian mapping is sparse or unavailable in much of the analysis area. To provide consistent coverage across the entire analysis area, riparian and wetland areas were determined using NWReGAP and SWReGAP land cover type categories. As SWReGAP has not been ground-truthed in the entire coverage area, and delineating wetland and riparian areas from aerial imagery can be difficult, not all wetland and riparian areas may be captured within the analysis area. It also may overestimate wetland and riparian areas especially in the southern portions of the analysis area. Land cover types identified in **Table 3.5-2** were further split out into five riparian and wetland types. The riparian and wetland types and their spatial extent within the analysis area are listed in **Table 3.5-3**.

Table 3.5-3 Riparian and Wetland Types within the Analysis Area

Riparian and Wetland Types	Extent within Analysis Area (acres)
Greasewood Flat	875,991
Herbaceous Wetlands	
Depression Wetlands	24,477
Marshes	36,860
Playas	126,902
Woody Riparian and Wetland Areas	
Montane Riverine	132,263
Riverine	82,609

Table 3.5-3 Riparian and Wetland Types within the Analysis Area

Riparian and Wetland Types	Extent within Analysis Area (acres)
Open Water	154,328
Riparian	
Wash	67,761
Total	**1,501,192**

Wetlands are found in areas with a connection to a permanent water source such as the groundwater table, or surface drainages, or where an impermeable soil subhorizon prevents water from draining through the surface profile. Vegetation can consist of herbaceous and woody species that are adapted to saturated soil conditions, and are often salt tolerant.

Greasewood flats are found in all four states crossed by the analysis area. This vegetation community type is defined as a mixed wetland and upland land cover type. Based on the categorization used by NWReGAP and SWReGAP, greasewood flats are defined as a woody wetland. Greasewood flats can cover large, flat areas, on broad expenses along lake shores and playas, on older alluvial terraces, on broad or narrow floodplains, or on stream terraces along drainages. Sites typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing season. Despite salt accumulations, the water table remains high enough to maintain vegetation. The water table is typically shallow, and the soils are extremely saline. The vegetation cover is open to moderately dense shrublands that are typically halophytes (saline tolerant species) and can consist of both upland and wetland species. Typical species include greasewood species (*Sarcobatus* spp.), winter fat (*Kraschenkovia lanata*), and saltbush species (A*triplex* spp.). Herbaceous species are salt tolerant and include salt grass (*Distichlis spicata*), common spikerush (*Eleocharis palustris*), and alkali sacaton (*Sporobolus airoides*).

Based on the NWReGAP and SWReGAP land cover categories, the herbaceous wetland types in the analysis area are depressional wetlands, marshes, and playas. The depressional wetlands are concave to flat herbaceous wetlands which can include alpine wet meadows, fens, palustrine emergent, and closed and open depressions. Typical wetland species include sedges (*Carex* spp.), rushes (*Juncus* spp.), reedgrass (*Calamagrostis* spp.), spikerush (*Eleocharis* spp.), bulrush (*Scirpus* spp., *Schoenoplectus* spp.), cattails (*Typha* spp.), and canarygrass (*Phalaris* spp.). Playas are barren and sparsely vegetated concave areas that are intermittently flooded. Species around the edges of the playas are typically saline-tolerant such as greasewood (*Sarcobatus vermiculatus*) and saltbush species (*Atriplex* spp.). SWReGAP only identifies playas in the southwestern portion of the analysis area. However, playa type wetlands are common throughout the analysis area.

Woody riparian and wetland areas are found along river, stream, and drainage corridors, and greasewood flats. Within the analysis area, woody riparian and wetland areas are further divided into montane riverine and riverine riparian types. Montane riverine areas are found at higher elevations in Regions I, II, and III. Montane riverine communities are found in areas with natural hydrologic regimes, areas with annual to episodic flooding, flood zones, sand or cobble bars, streambanks along perennial and seasonally intermittent streams, and around seeps, fens, and isolated springs on hillsides. Communities tend to be mosaics of multiple woodland and shrubland communities. Vegetation is usually a mix of riparian shrub and tree species including cottonwood (*Populus* spp.), willow (*Salix* spp.), dogwoods (*Cornus* spp.), birch (*Betula* spp.), alders (*Alnus* spp.), chokecherry (*Prunus virginiana*), and boxelder (*Acer negundo*). In the southern portions of Region III, species composition is similar but also can include Arizona willow (*Juglans major*), mesquite (*Prosopis* spp.), velvet ash (*Fraxinus velutina*), and wingleaf soapberry (*Sapindus saponaria*). Herbaceous species are similar to the ones described for herbaceous wetlands. Exotic trees including

Russian olive (*Elaeagnus angustifolia*) and salt cedar (tamarisk [*Tamarix* spp.]) are common in some stands.

Riverine areas are found along washes, arroyos, streams, rivers, floodplains, and desert valleys, where intermittent flooding occurs overflowing the defined banks of the drainage, or where the groundwater table is high. Vegetation types are variable based on elevation, flooding frequency and duration, stream gradient, floodplain width, climate, substrate, and disturbance regimes (livestock grazing, water diversion structures, or invasive species). Typically, annual or periodic flooding, or an annual rise in the water table is required by the riparian species for growth and reproduction. Vegetation is usually a mix of riparian shrub and tree species similar to those identified for montane riverine wetland communities. Typical herbaceous species are similar to the ones described for herbaceous wetlands. The invasive riparian tree species salt cedar and Russian olive are often found in these areas.

Open water in the analysis area consists of rivers, streams, lakes, reservoirs, and stock ponds. See Section 3.4, Water Resources, for a discussion of the open water features within the analysis area.

3.5.4.4 Wildland Fire

Within each vegetative community type found in the analysis area, there is a characteristic fire regime. A fire regime is a general description of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993; Brown 1995). Historical fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. Generally, fire frequency is inversely related to fire intensity. For example, due to higher precipitation levels and cooler mean temperatures (which foster plant growth), there are higher fuel loads in pinyon-juniper woodlands and upper montane forest vegetation types as compared to lowland shrublands and grasslands. In addition, higher precipitation amounts and cooler temperatures provide greater resistance to fire for longer periods. This leads to infrequent, high-intensity fires in montane and subalpine forests. The reverse is true in grasslands where fine fuel types lead to fires at a high frequency that burn rapidly with low intensity. Other factors that determine fire behavior include site topography, weather and climatic conditions, time of year, type of plant community, health of the ecosystem, fuel moisture levels, depth and duration of heat penetration, fire frequency, and site productivity. The highest potential rates of fire spread occur in areas with flashy fuels such as cured-out annual bromes, and steep brushy mountain slopes. Wildland fire risk tends to be high in disturbed grasslands and forblands dominated by non-native noxious and invasive species, especially those dominated by annual brome species.

There are five natural (historical) fire regimes classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation (National Interagency Fuels, Fire, and Vegetation Technology Transfer 2010). These five regimes include:

- I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- II – 0-35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- III – 35-200+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- IV –35-200+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- V – 200+ year frequency and high (stand replacement) severity.

Fire Regime Condition Class (FRCC) is a discrete metric that describes how similar a landscape's fire regime is to its natural or historical state. FRCC quantifies the amount that current vegetation has departed from the simulated historical vegetation reference conditions (Barrett et al. 2010; Hann and Bunnell 2001; Hardy et al. 2001; Holsinger et al. 2006). The three condition classes describe low departure (FRCC 1), moderate departure (FRCC 2), and high departure (FRCC 3). Landscapes determined to fall within the category of FRCC 1 contain vegetation, fuels, and disturbances characteristic of the natural regime; FRCC 2 landscapes are those that are moderately departed from the natural regime; and FRCC 3 landscapes reflect vegetation, fuels, and disturbances that are uncharacteristic of the natural regime. More detailed descriptions of the fire regime condition classes and associated attributes are provided in **Table 3.5-4**.

Table 3.5-4 Fire Regime Condition Class Description

Condition Class	Fire Regime	Example Management Options	Species Composition and Structure	Non-native Species
Condition Class I	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Where appropriate, these areas can be maintained within the natural (historical) fire regime by treatments such as fire use.	Species composition and structure are functioning within their natural (historical) range at both patch and landscape scales.	Non-native species are currently not present or present in limited extent. Through time, or following disturbance, sites are potentially vulnerable to invasion by non-native species.
Condition Class II	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the natural fire regime.	Species composition and structure have been moderately altered from their historical range at patch and landscape scales.	Populations of nonnative invasive species may have increased, thereby increasing the potential risk for these populations to expand following disturbances, such as wildfires.
Condition Class III	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the natural fire regime.	Species composition and structure have been substantially altered from their historical range at patch and landscape scales.	Invasive species maybe common and in some cases the dominant species on the landscape. Any disturbance will likely increase both the dominance and geographic extent of these invasive species.

3.5.4.5 USFS MIS Plant Species

The USFS defines Management Indicator Species (MIS) for each national forest. A Management Indicator Species (MIS) is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that their status and trends provide insight to the integrity of the larger ecological system to which they belong.

Wildlife MIS species are discussed in Section 3.7, Wildlife. There is only one identified MIS plant species within the USFS national forests crossed by the project, which is discussed below.

The one identified MIS plant species is Rydberg milkvetch (*Astragalus perianus*) for the Fishlake National Forest. The perennial species has clustered stems arising from a subterranean caudex. The flowers are sparse and white or lavender tinged. The species flowers and fruits from June to September. It is found in sparsely vegetated areas on shallow soils from 7,200 to 11,500 feet (USFS 2006). It is primarily associated in openings in spruce-fir forests, but other common vegetation community associations include mountain big sagebrush, black sagebrush, alpine krummholz, mixed-conifer, and open aspen-fir-mahogany (USFS 2006). Distribution appears to be determined by substrate and elevation. Typical substrates are igneous intrusive gravels, volcanic gravel, or clayey soils. It was listed as a USFWS threatened species in 1978, and delisted in 1989. The species was listed as a USFS Sensitive Species from 1989 to 1994. The Fishlake National Forest included the species as an MIS in their 1986 forest plan when the population of Rydberg milkvetch on the Fishlake National Forest was estimated to be about 4,000. Currently, the plant is known to exist in at least 20 locations with a combined population in excess of 100,000. The species was included as an MIS species based on its previous listing as a USFWS threatened species, and its representation of a selected habitat type of igneous intrusive and volcanic gravels between 8,000 and 11,000 feet (USFS 2006). Threats to the species include ORV use, grazing, mining, or severe erosion (USFS 2006).

3.5.5 Regional Summary of Vegetation

As described in Section 3.5.4, Baseline Description, a wide variety of land cover and associated vegetation communities are found within the analysis area. Many of these vegetation communities are found over a wide geographic area within the analysis area. Land cover and associated vegetation communities are described in Section 3.5.4, Baseline Description, and summarized by Project region below.

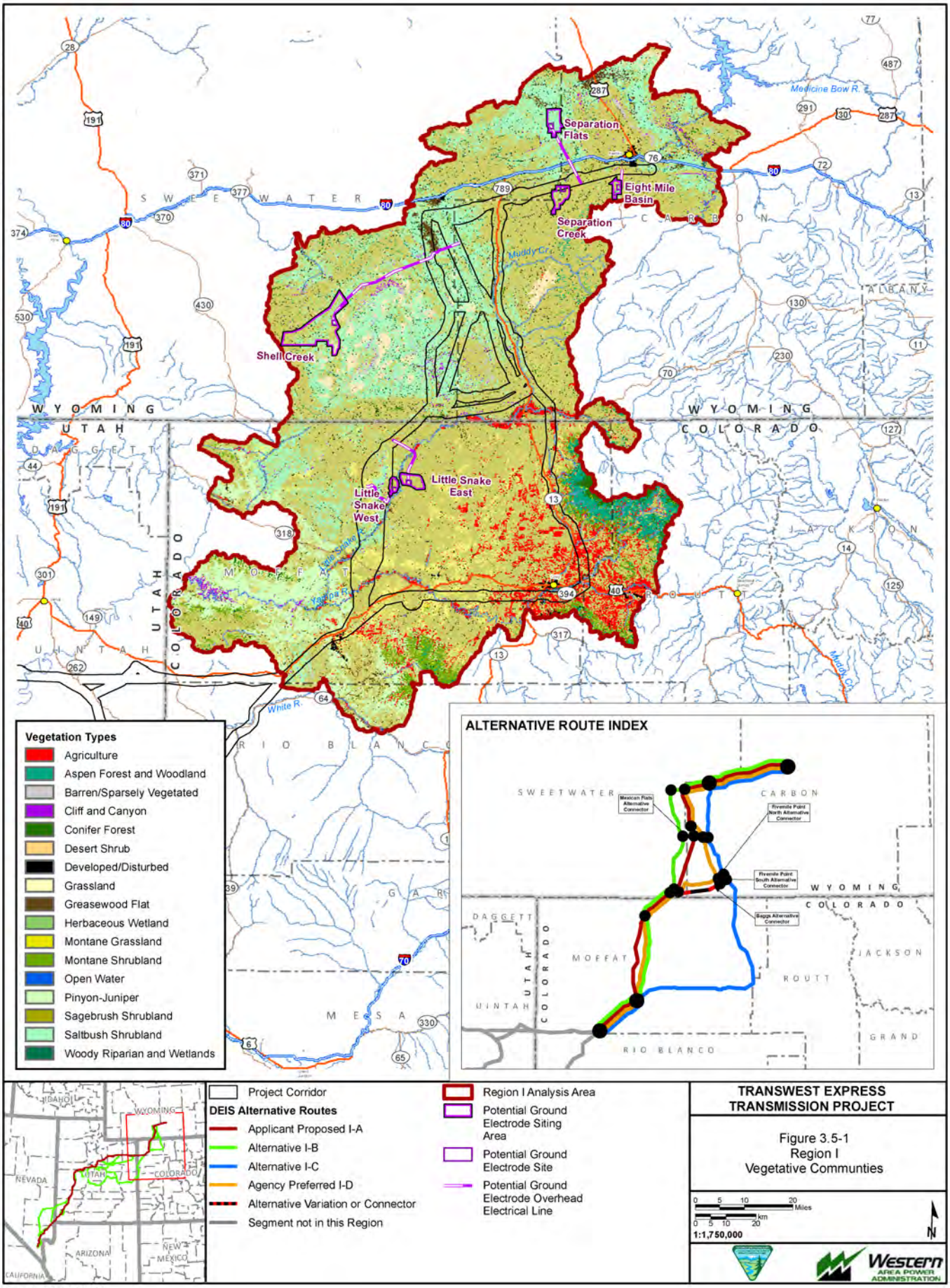
Table 3.5-5 summarizes the percent of each land cover and associated vegetation community within the analysis area by region. Shrublands are the dominant land cover in each region, with sagebrush shrubland and desert shrub the two most common vegetation communities. Vegetation communities found within the analysis area for each Project region are presented in **Figures 3.5-1** through **3.5-4**.

In Region I, the dominant vegetation communities are sagebrush shrubland, and saltbush shrubland, especially through Wyoming, Moffat County, Colorado, and Uintah County, Utah. In the Colorado and Utah portions of Region I at higher elevations, pinyon-juniper communities become more dominant. Overall in Region I, pinyon-juniper accounts for 6 percent of the analysis area. Riparian and wetland areas are predominantly herbaceous wetlands and open water. Open water and associated riparian corridors are found along the Little Snake River and the Yampa River. Agriculture is 4 percent of the analysis area and typically consists of irrigated pasture and haylands. Agriculture lands are found mainly around the valley floors near Baggs, Wyoming. Developed and disturbed lands are 2 percent of the Region I analysis area, and consist predominantly of roads, oil and gas development, and urban areas including Rawlins, Wyoming.

Region II is predominantly sagebrush shrubland, saltbush shrubland, and pinyon-juniper vegetation communities. The topography varies greatly in Region II as the area includes high deserts, mountain ranges, valleys, canyons, gorges, mesas, and buttes. In the east of Region II is the Uintah Basin; while in the south portion of Region II is the Book Cliffs and San Rafael Swell, a dome-shaped anticline of sandstone, shale, and limestone. In the north of Region II are the Uinta Mountains, while the Wasatch Mountains cross the center of the Region. Pinyon-juniper vegetation communities are dominant in the higher elevation areas, especially in the Wasatch Mountains, Book Cliffs, and the Uinta Mountains. Sagebrush shrubland is dominant in the mid-elevation areas, with saltbush shrublands common in the lower elevations and the San Rafael Swell. Riparian and wetland areas are predominantly herbaceous wetlands and open water. Open water and associated riparian corridors are found mainly along the Green River and the White River. Agriculture is 4 percent of the Region II analysis area, and is typically irrigated alfalfa, corn, and hay. Developed and disturbed lands are 4 percent of the analysis area, and consist of oil and gas development, logged areas, roads, power plants, utility corridors, and urban areas.

Table 3.5-5 Vegetation Community Types Within the Analysis Area by Region

Cover and Land Use Types	Vegetative Communities Associated with Each Cover Type	Acres and Percent of Vegetation Type Within the Analysis Area by Region							
		I		II		III		IV	
		Acres	%	Acres	%	Acres	%	Acres	%
Agriculture	Agriculture	230,482	4	484,528	4	69,423	1	-	-
Barren/Sparsely Vegetated	Barren/Sparsely Vegetated	36,819	1	222,948	2	29,338	<1	32,592	3
	Cliff and Canyon	29,704	1	565,493	5	164,119	2	57,076	5
	Dunes	85,276	2	32,567	<1	15,313	<1	-	-
Developed/Disturbed	Developed/Disturbed	107,794	2	459,785	4	180,970	2	239,577	21
Forest and Woodland	Aspen Forest and Woodland	89,921	2	544,114	5	7,448	<1	-	-
	Conifer Forest	35,190	1	477,815	4	26,599	<1	-	-
	Deciduous Forest	39	<1	13,869	<1	26	<1	-	-
	Pinyon-Juniper	303,173	6	2,483,995	22	1,292,483	18	1,888	<1
Grassland	Grassland	210,626	4	519,056	5	801,113	11	7,121	1
	Montane Grassland	3,788	<1	65,241	1	1,284	<1	-	-
	Tundra	-	-	13,956	<1	-	-	-	-
Greasewood Flat	Greasewood Flat	90,502	2	511,410	5	274,079	4	-	-
Riparian and Wetland Areas	Open Water	11,332	<1	61,376	1	12,218	<1	69,401	6
	Herbaceous Wetland	25,146	<1	80,634	1	81,741	1	719	<1
	Riparian	728	<1	-	-	65,185	1	2,576	<1
	Woody Riparian and Wetlands	47,585	1	110,822	1	54,368	1	1,096	<1
Shrubland	Desert Shrub	-	-	125,982	1	2,227,441	30	720,701	63
	Montane Shrubland	117,240	2	570,993	5	187,059	3	-	-
	Sagebrush Shrubland	3,038,971	57	2,307,131	21	1,192,955	16	671	<1
	Saltbush Shrubland	885,851	17	1,468,576	13	635,456	9	1,912	<1
Total		**5,350,440**	**100**	**11,120,291**	**100**	**7,318,618**	**100**	**1,135,330**	**100**


Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake East
Little Snake West
Medicine Bow R.
Muddy Cr.
White R.
Little Snake
Yampa R.
SWEETWATER
CARBON
ALBANY
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
JACKSON
ROUTT
UINTAH
RIO BLANCO
GRAND
MESA
Vegetation Types
Agriculture
Aspen Forest and Woodland
Barren/Sparsely Vegetated
Cliff and Canyon
Conifer Forest
Desert Shrub
Developed/Disturbed
Grassland
Greasewood Flat
Herbaceous Wetland
Montane Grassland
Montane Shrubland
Open Water
Pinyon-Juniper
Sagebrush Shrubland
Saltbush Shrubland
Woody Riparian and Wetlands
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Riverside Point North Alternative Connector
Riverside Point South Alternative Connector
Baggs Alternative Connector
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Region I Analysis Area
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.5-1
Region I
Vegetative Communities
Miles
km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
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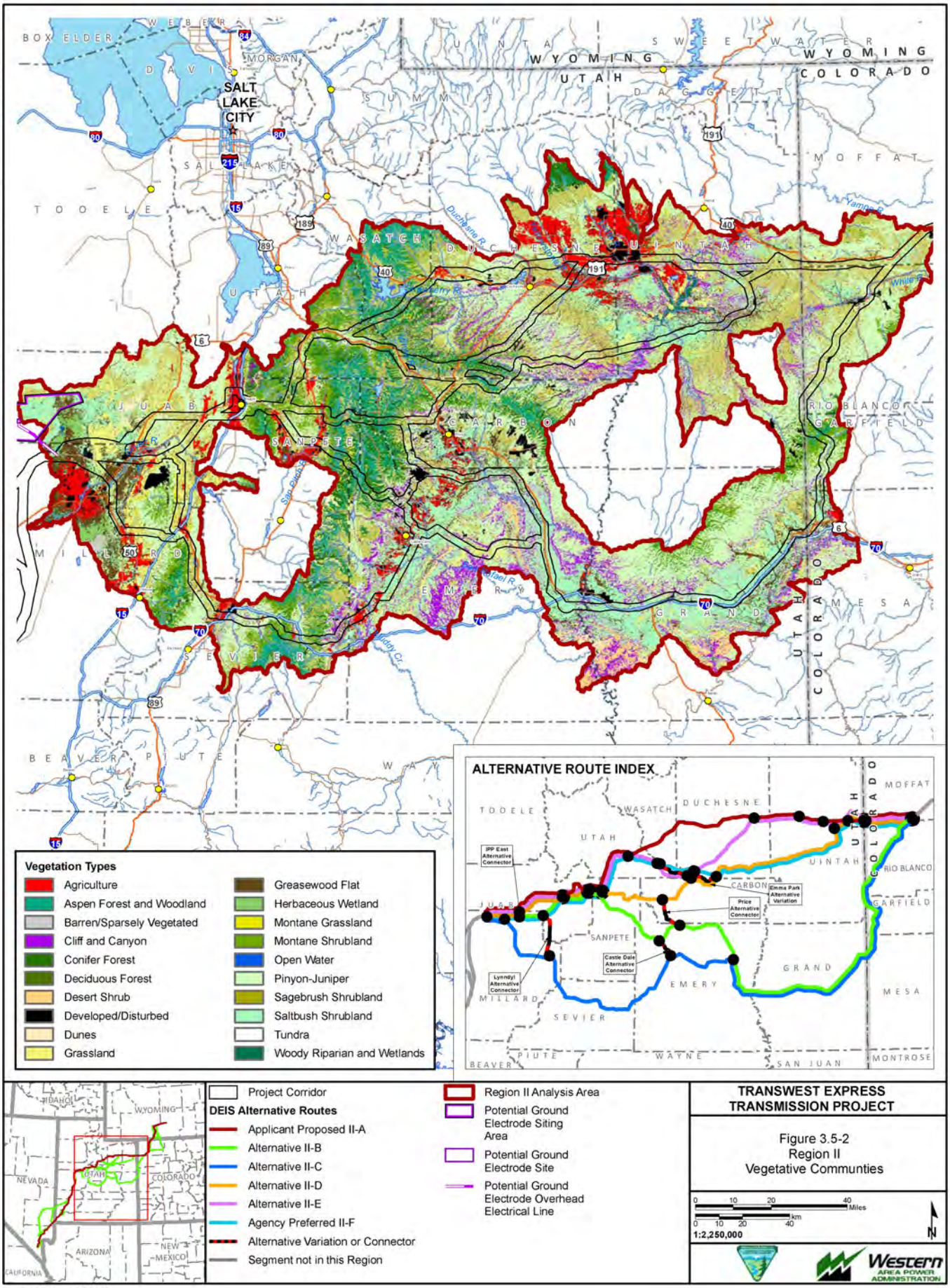

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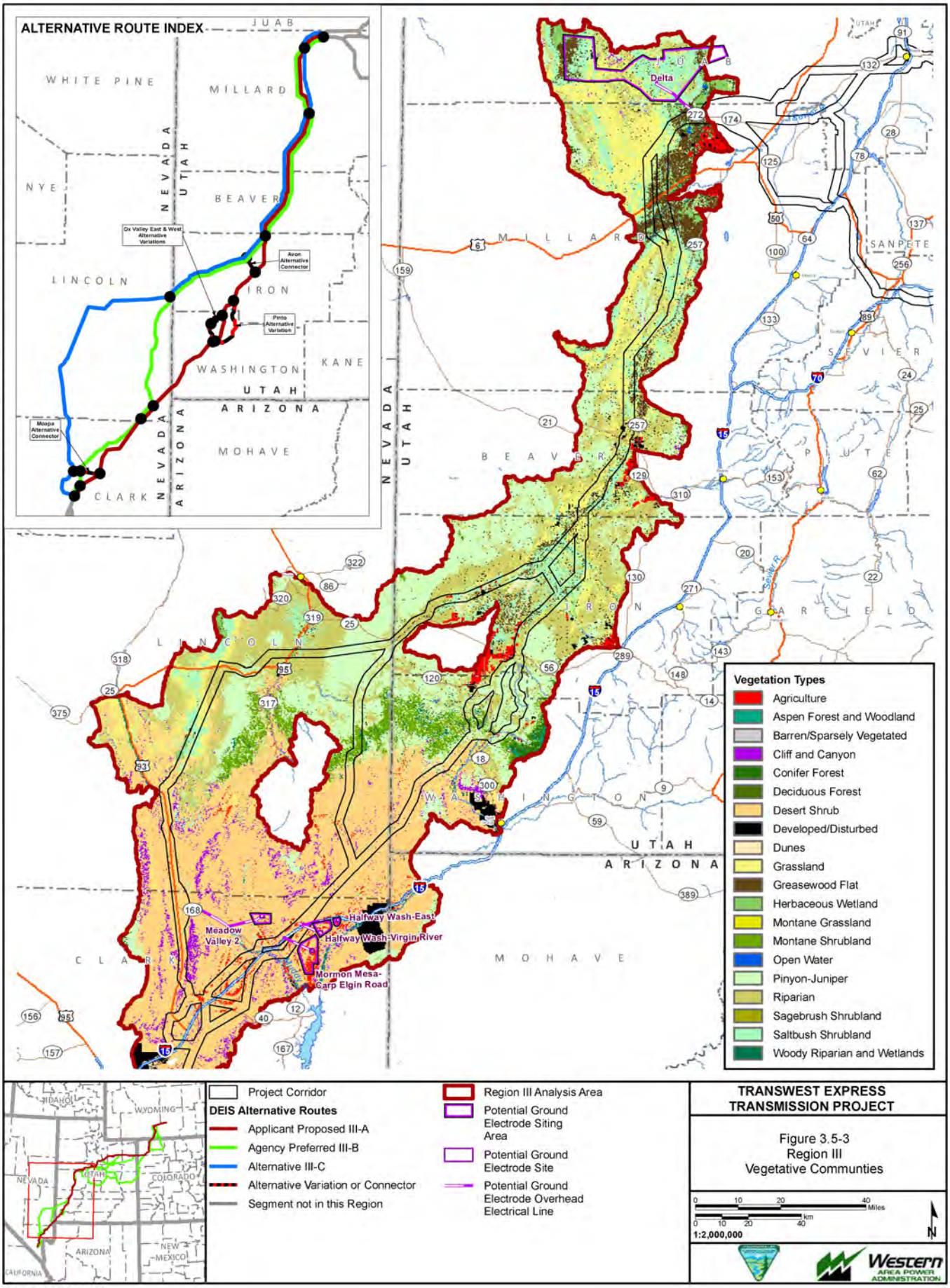
ALTERNATIVE ROUTE INDEX
WHITE PINE
MILLARD
NYE
BEAVER
LINCOLN
IRON
WASHINGTON
KANE
MOHAVE
CLARK
NEVADA
UTAH
ARIZONA
Dx Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
Delta
SANPETE
SEVIER
PIUTE
GARFIELD
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
Vegetation Types
Agriculture
Aspen Forest and Woodland
Barren/Sparsely Vegetated
Cliff and Canyon
Conifer Forest
Deciduous Forest
Desert Shrub
Developed/Disturbed
Dunes
Grassland
Greasewood Flat
Herbaceous Wetland
Montane Grassland
Montane Shrubland
Open Water
Pinyon-Juniper
Riparian
Sagebrush Shrubland
Saltbush Shrubland
Woody Riparian and Wetlands
Project Corridor
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Region III Analysis Area
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.5-3
Region III
Vegetative Communities
1:2,000,000
Western AREA POWER ADMINISTRATION
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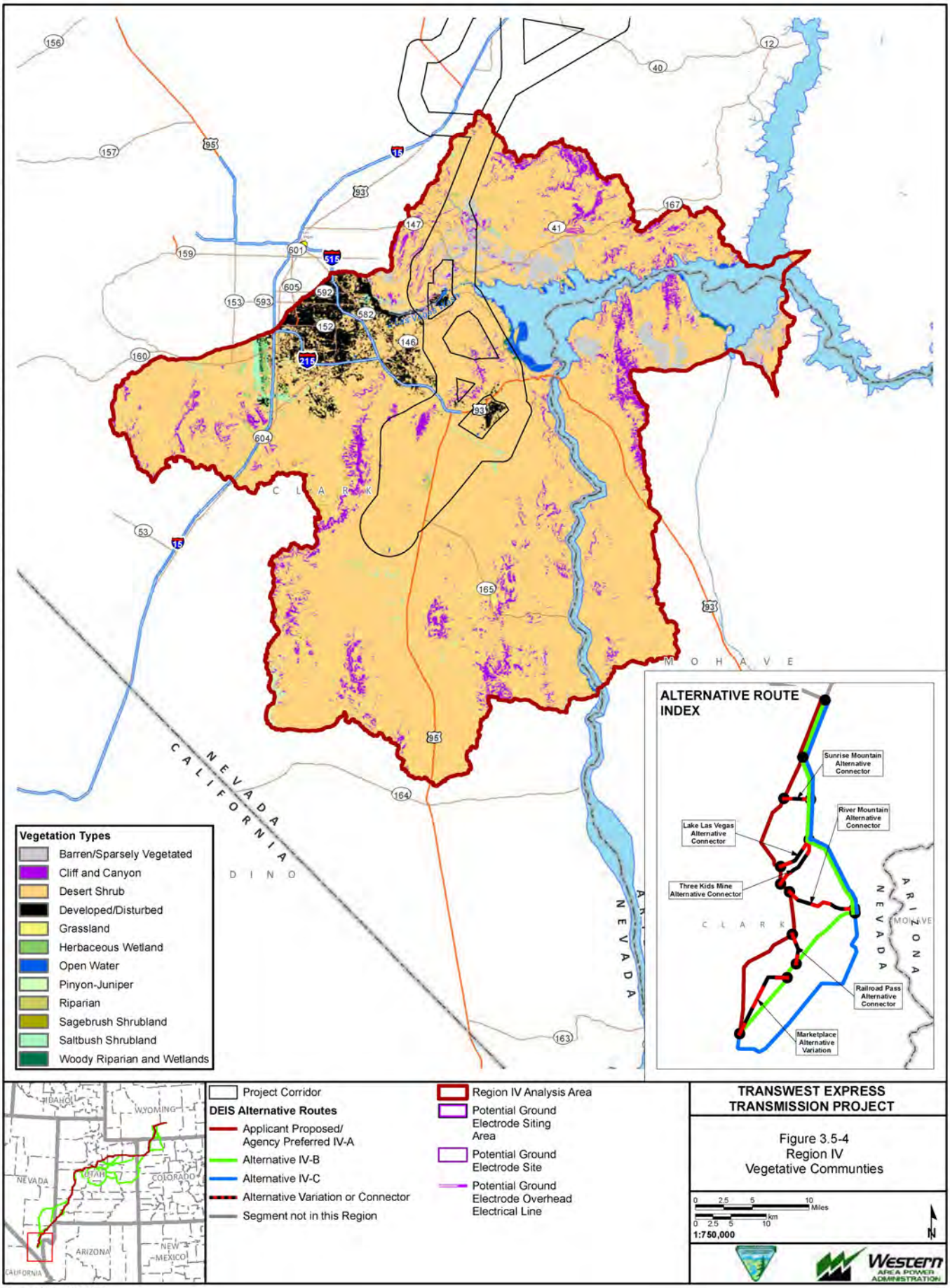
ALTERNATIVE ROUTE INDEX
Sunrise Mountain Alternative Connector
River Mountain Alternative Connector
Lake Las Vegas Alternative Connector
Three Kids Mine Alternative Connector
Railroad Pass Alternative Connector
Marketplace Alternative Variation
CLARK
NEVADA
ARIZONA
MOHAVE
CALIFORNIA
DINO
Vegetation Types
Barren/Sparsely Vegetated
Cliff and Canyon
Desert Shrub
Developed/Disturbed
Grassland
Herbaceous Wetland
Open Water
Pinyon-Juniper
Riparian
Sagebrush Shrubland
Saltbush Shrubland
Woody Riparian and Wetlands
IDAHO
WYOMING
UTAH
COLORADO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed/ Agency Preferred IV-A
Alternative IV-B
Alternative IV-C
Alternative Variation or Connector
Segment not in this Region
Region IV Analysis Area
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.5-4
Region IV
Vegetative Communties
0 2.5 5 10 Miles
0 2.5 5 10 km
1:750,000
N
Western AREA POWER ADMINISTRATION
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Desert shrub, pinyon-juniper, sagebrush shrubland, grassland, and saltbush shrubland are the dominant vegetation communities in Region III. Sagebrush shrubland, pinyon-juniper, grassland, and saltbush shrubland are dominant in the portions of Region III analysis area in Utah, while desert shrub is dominant in the Nevada portions of Region III. Wetland areas are a mix of herbaceous wetlands, riparian communities, woody riparian and wetlands, and open water. Agriculture is 1 percent of the Region III analysis area, and is limited by available water. Developed and disturbed lands are 2 percent of the analysis area, and consist of military lands, roads, utility corridors, industrial, and urban areas.

Region IV is dominated by desert shrub vegetation communities. Much of Region IV (21 percent) is disturbed and developed. The other common vegetation communities are cliff and canyon, barren/sparsely vegetation, and open water. Wetland areas are a mix of herbaceous wetlands, riparian communities, woody riparian and wetlands, and open water. There are no agriculture lands in Region IV. Developed and disturbed lands are 21 percent of the analysis area, and consist of urban development in the Las Vegas metropolitan area, military lands, transmission line corridors, solar power plants, and electrical substations.

For more detail on land use in each region, see Section 3.14, Land Use. For more detail on surface water, see Section 3.4, Water.

3.5.5.1 Noxious and Invasive Weed Species

As described in Section 3.5.4, Baseline Description, noxious and invasive weed species are an issue for all land management agencies and private landowners throughout the analysis area. **Appendix G** contains a list of regulated noxious weed species by region for each state within the analysis area. Noxious weed occurrence data is not available with enough consistency and geographic range to be presented by region.

On federal lands in the analysis area, dominant noxious and invasive species include grasses in the *Bromus* genus, halogeton, houndstongue, leafy spurge, Canada thistle, salt cedar, spotted knapweed, rush skeletonweed, Russian knapweed, diffuse knapweed, and hoary cress.

3.5.5.2 Riparian and Wetland Areas

As described in Section 3.5.4, Baseline Description, there are several riparian and wetland types found within the analysis area. While only occurring in a small proportion of the analysis area, the riparian and wetland areas are found over a wide geographic area. Riparian and wetland types are described in Section 3.5.4, Baseline Description, and summarized by region below.

Table 3.5-6 summarizes the percent of each riparian and wetland type within the analysis area. Most of the riparian and wetland areas cover less than 1 percent of the analysis area, except for greasewood flats and open water. Greasewood flats, which can be a mix of wetlands and uplands, cover 2, 5, and 4 percent of Regions I, II and III, respectively, while open water covers 6 percent of Region IV. Riparian and wetland types found within each Project region are included in **Figures 3.5-1** through **3.5-4**.

Table 3.5-6 Percent of Riparian and Wetland Areas in the Analysis Area by Region

	Acres and Percent of Region by Riparian and Wetland Type							
	I		II		III		IV	
Riparian and Wetland Types	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Greasewood Flat	90,502	2	511,410	5	274,079	4	--	--
Herbaceous Wetlands								
Depression Wetland	24,477	<1	--	--	--	--	--	--
Marsh	659	<1	30,224	<1	5,522	<1	455	<1
Playa	9	<1	50,409	<1	76,220	1	264	<1

Table 3.5-6 Percent of Riparian and Wetland Areas in the Analysis Area by Region

	Acres and Percent of Region by Riparian and Wetland Type							
	I		II		III		IV	
Riparian and Wetland Types	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Woody Riparian and Wetland Areas								
Montane Riverine	8,824	<1	82,402	<1	41,038	<1	--	--
Riverine	39,762	<1	28,420	<1	13,331	<1	1,096	<1
Open Water	11,332	<1	61,376	<1	12,218	<1	69,401	6
Riparian								
Wash	--	--	--	--	65,185	<1	2,576	<1

3.5.5.3 Wildland Fire

The analysis area contains a diverse mix of vegetation communities and land cover types, each having a distinct fire regime. All five fire regimes are found within the analysis area. Spatial extent of the analysis area defined by each fire regime is summarized in **Table 3.5-7**. All three categories of FRCC also are found within the analysis area. Spatial extent of the analysis area defined by each Condition Class is summarized in **Table 3.5-8**. **Figures 3.5-5** through **3.5-8** depict the FRCC in each region.

Table 3.5-7 Fire Regime Acreage for each Region

Fire Regime Class	Frequency (Fire Return Interval)	Severity	Region I	Region II	Region III	Region IV
I	0 to 35+ years, frequent	Predominantly Low	62,534	599,855	102,839	9,805
II	0 to 35+ years, frequent	Replacement	3,052	0	0	0
III	35 to 200+ years, less infrequent	Mixed and Low	690,257	3,237,004	1,528,714	3,273
IV	35 to 200+ years, less infrequent	Replacement	4,141,470	3,526,112	1,301,718	6
V	200+ years	Replacement	233,921	2,378,326	3,782,259	870,198

Table 3.5-8 Acres of Lands Classified as FRCC 1, 2, or 3 within the Analysis Area by Region

Condition	Region I	Region II	Region III	Region IV
Condition Class 1	916,979	2,371,562	663,238	268
Condition Class 2	2,771,222	3,957,532	1,753,603	128,741
Condition Class 3	1,506,743	3,797,577	4,207,606	717,950

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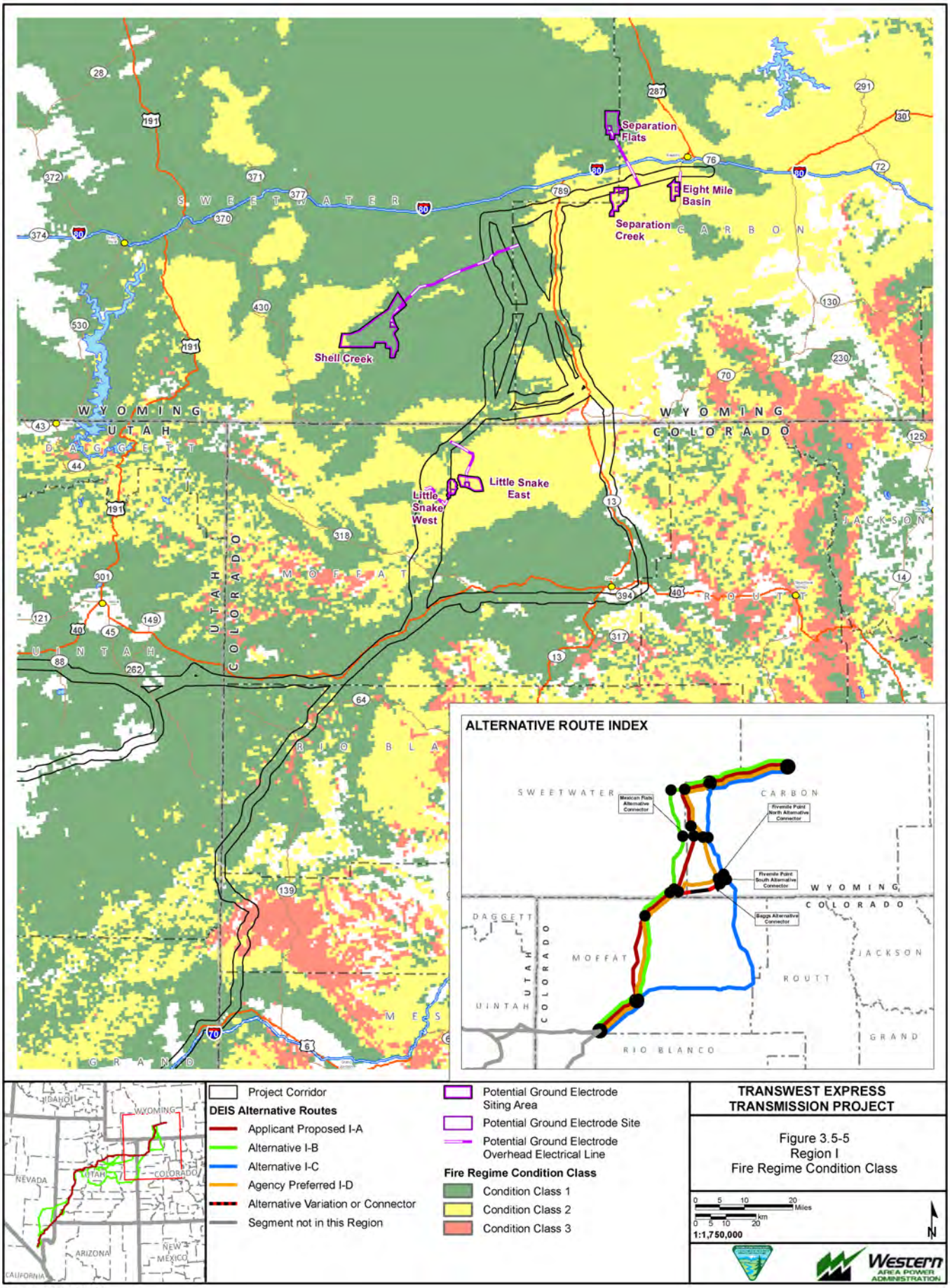

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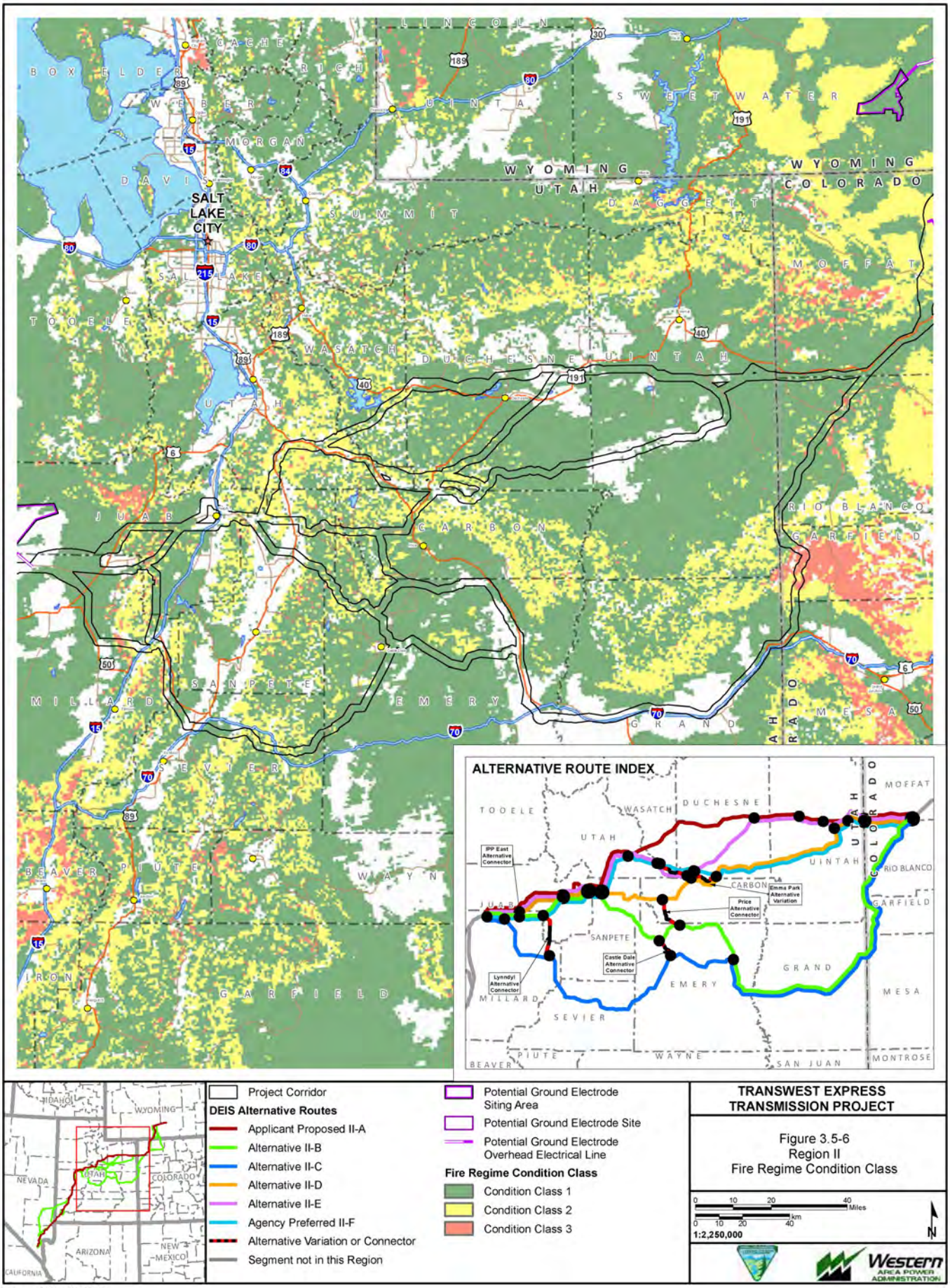

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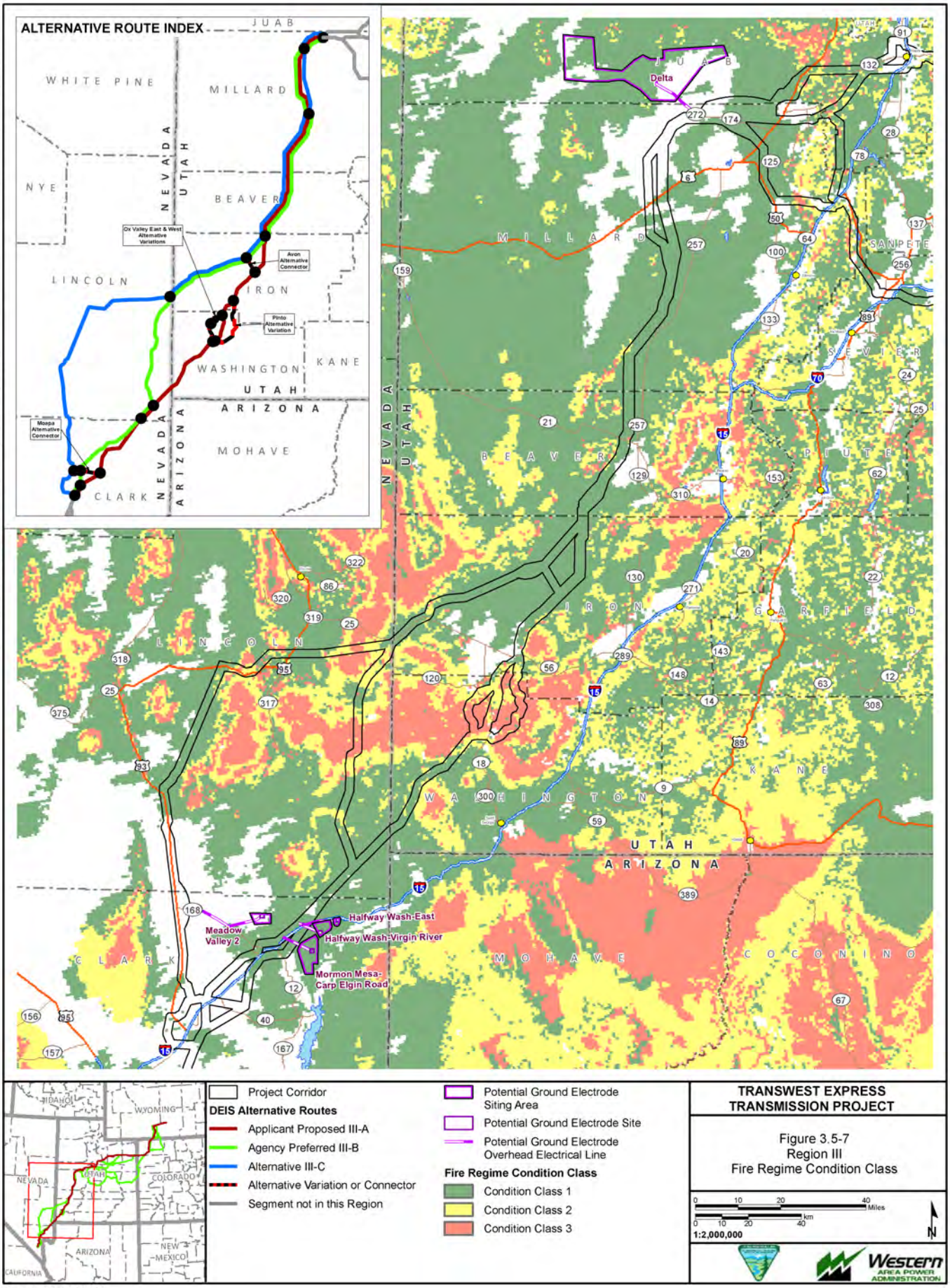
ALTERNATIVE ROUTE INDEX
JUAB
WHITE PINE
MILLARD
NEVADA
UTAH
NYE
BEAVER
Ox Valley East & West Alternative Variations
Avon Alternative Connector
LINCOLN
IRON
Pinto Alternative Variation
WASHINGTON
KANE
UTAH
ARIZONA
Moapa Alternative Connector
MOHAVE
CLARK
Delta
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
SANPETE
SEVIER
PIUTE
GARFIELD
COCONINO
IDAHO
WYOMING
COLORADO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Fire Regime Condition Class
Condition Class 1
Condition Class 2
Condition Class 3
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.5-7
Region III
Fire Regime Condition Class
Miles
km
1:2,000,000
N
Western AREA POWER ADMINISTRATION
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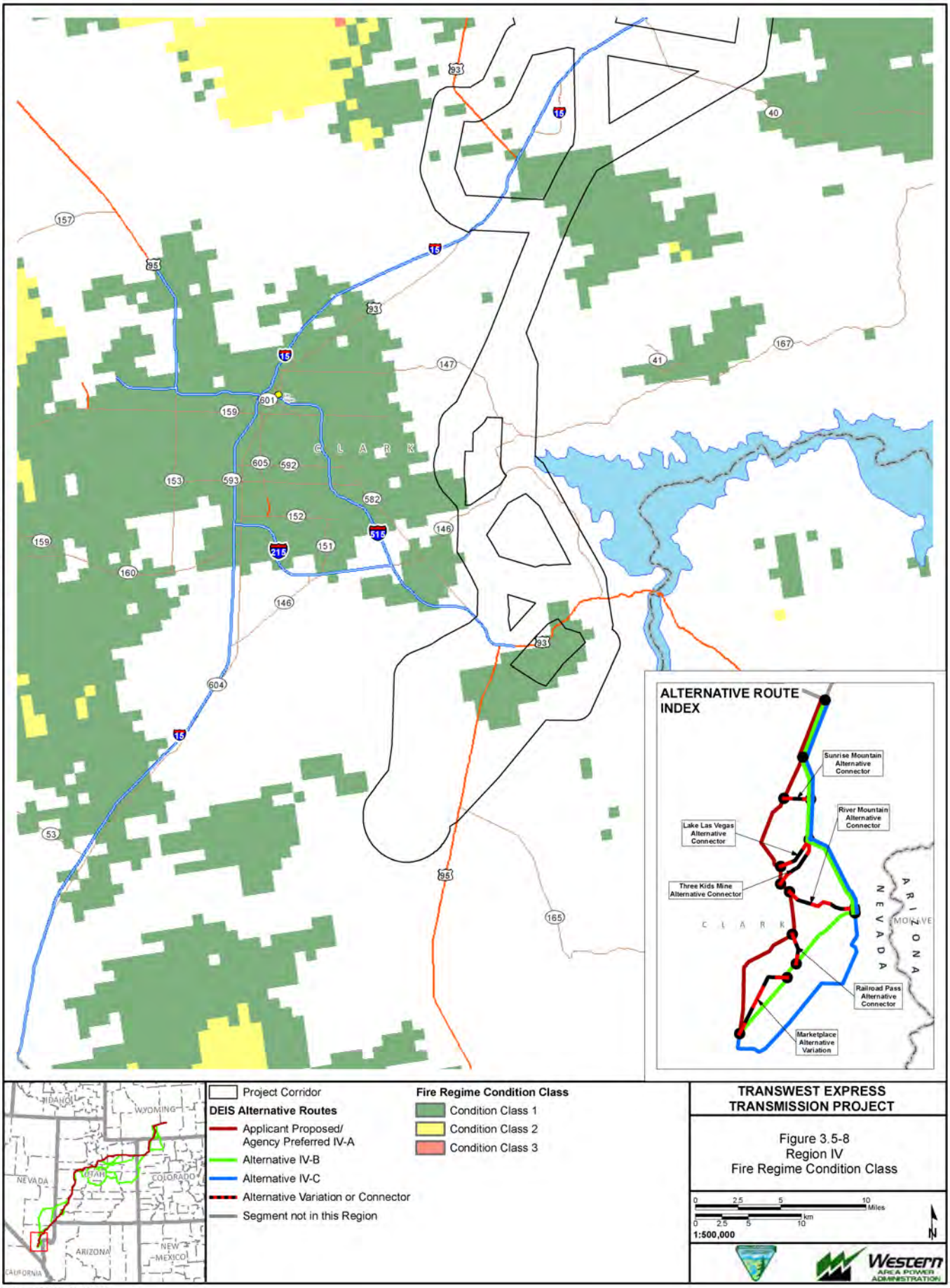

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.5-8
Region IV
Fire Regime Condition Class

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3.5.5.4 USFS MIS Plant Species

Within the analysis area, the Rydberg milkvetch is found in Region II, in the southern part of the USFS Fishlake National Forest. It has been found in five locations in abundant numbers. Potential habitat is found in the analysis are in the USFS Fishlake National Forest based on substrate, elevation, and vegetation parameters. The population historically has been found to be stable and viable across the USFS Fishlake National Forest (USFS 2006).

3.5.6 Impacts to Vegetation Resources

As described in Section 3.5.3, Analysis Area, the analysis area for vegetation resources encompasses the HUC 10 watershed boundaries crossed by the 2-mile transmission line corridor. For the impacts discussion, the focus is on the impacts resulting from construction and operation activities within the 2-mile transmission line corridor and the 250-foot-wide transmission line ROW. The 2-mile transmission line corridor contains a 1-mile buffer on each side of each alternative route. The 250-foot-wide transmission line ROW is located within the 2 mile transmission line corridor and would contain the surface footprint for all facilities associated with construction and operations except the terminals and electrode beds. Access roads would be located within the ROW where practical. Within the 2-mile transmission line corridor and outside the 250-foot-wide transmission line ROW, access roads would be the only surface disturbance. The larger analysis area (2-mile transmission line corridors) for access roads was required because their locations have not been defined at this time. Surface facilities located outside the 2-mile transmission line corridor include terminals and electrode beds.

The primary issues associated with vegetation resources include direct and/or indirect impacts to native vegetation communities, riparian/wetland habitats, impacts associated with the introduction and/or spread of noxious weeds and invasive species, and changes in fire regime and FRCC.

To evaluate impacts on vegetation resources, potential impacts to vegetation resources were identified based on the locations of these resources in relation to the proposed surface disturbance areas. To determine acres of vegetation disturbed by the project, the known locations of proposed surface disturbances have been overlain on the vegetation layer to determine the amount of acreage disturbed for each vegetation type using GIS as described in the introduction to Chapter 3.0. For impacts from noxious weeds, areas of higher risk of introduction or spread of noxious weed and invasive species have been identified based on vegetation community type, soil constraints, and climate. To determine impacts to wetland resources and fire ecology, the same methodology as described above for vegetation resources has been applied.

Impact issues and the analysis considerations for vegetation resources are listed in **Table 3.5-9**. Impact parameters are used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among alternatives or alternative variations. The following impact parameters were used for this analysis:

- Effects of construction activities on the spread and establishment of noxious and invasive weed species;
- Acres of disturbance based on the extent of construction activities in wetland/riparian areas;
- Acres of fire susceptible vegetation communities crossed, fire frequency and interval.

Table 3.5-9 Relevant Analysis Considerations for Vegetation

Resource Topic	Analysis Considerations and Relevant Assumptions
Erosion and Non-native Species Invasion	Areas of recently disturbed bare ground would be more susceptible to erosion and invasion by non-native species.
Reclamation Timeframes	Erosion from disturbed areas would be minimal once vegetation or other surface stabilization is established. Successful establishment of herbaceous vegetation generally takes a minimum of 3 to 5 years, depending on soil and precipitation. Areas with soil limitations, limited precipitation, and large number of invasive and weedy species can take up to 10 years or longer for herbaceous vegetation to successfully establish. In these areas, additional mitigation measures, such as integrated weed control, are often required for successful establishment of native vegetation. Some plant communities may not return to pre-construction conditions due to alteration of soils, noxious weed invasions, and loss of biological soil crust.
Revegetation	Areas with rehabilitation constraints (e.g., highly erodible or droughty soils, low precipitation amounts, etc.) can have little to no reclamation success, unless additional mitigation measures are implemented.
Landscape Fragmentation	Extensive networks of roads and utility corridors can lead to fragmentation of native landscapes, which can decrease species diversity, lead to decreases in the number and populations of native and special status species, and provide corridors for invasion of non-native species.
Vegetative Type Conversion	Proposed surface disturbance activities can result in the conversion of shrub and tree-dominated vegetation communities to grass/forb-dominated vegetation and the conversion of tree-dominated vegetation communities to shrub-dominated vegetation in the short and long term.
Fire and Fuels	Surface disturbance activities may result in noxious weed invasions, which can lead to alterations in fire regime and FRCC for vegetation communities.
Accidental Fire	Accidental wild fires caused by construction equipment or smoking during construction

3.5.6.1 Impacts from Terminal Construction and Operation

The Northern Terminal would be constructed regardless of alternative route. For the Proposed Action and alternatives corridors, the Southern Terminal would be located in Clark County, Nevada, at either the Southern Terminal or Southern Terminal Alternative location as described below. Under Design Option 2, the Southern Terminal would be located near IPP near Delta, Utah. **Table 3.5-10** identifies estimated acreage of project-related surface disturbance by vegetation cover type within the Northern, Southern, and Southern Alternative Terminal locations.

<u>Northern Terminal</u>

Construction of the Northern terminal would result in surface direct disturbance effects to 504 acres of vegetation. The majority of the disturbance associated with the Northern Terminal would occur in the saltbush and sagebrush shrubland vegetation communities. For the Northern Terminal, the herbaceous wetlands are depressional wetlands.

Surface disturbance activities associated with the Northern Terminal would include pre-development geotechnical sample drilling and site development, which involves vegetation clearing, grading, and facility construction. Construction-associated surface disturbance includes land cleared for storage areas, a

Table 3.5-10 Acreages of Affected Vegetation for the Northern, Southern, and Southern Alternative Terminals

	Northern Terminal				Southern Terminal				Southern Terminal Alternative			
	Construction Disturbance		Operation Disturbance		Construction Disturbance		Operation Disturbance		Construction Disturbance		Operation Disturbance	
Vegetation Type	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area
Total	504	<1	234	<1	412	<1	203	<1	412	<1	203	<1
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Cliff and Canyon	3	<1	1	<1	-	-	-	-	-	-	-	-
Conifer Forest	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	11	<1	6	<1	54	<1	26	<1
Developed/Disturbed	15	<1	7	<1	401	<1	197	<1	358	<1	177	<1
Dunes	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Grassland	1	<1	1	<1	-	-	-	-	-	-	-	-
Greasewood Flat	4	<1	2	<1	-	-	-	-	-	-	-	-
Herbaceous Wetland	9	<1	4	<1	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	180	<1	83	<1	-	-	-	-	-	-	-	-
Saltbush Shrubland	265	<1	123	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	27	<1	12	<1	-	-	-	-	-	-	-	-

Discrepancies in totals due to rounding error.

concrete batch plant site, temporary work areas, and pulling, tensioning, and splicing sites. Operation surface disturbance include foot prints of the access roads, the footprints of the station facilities, and the installation of perimeter fence.

Vegetation would be cleared within the entire Northern Terminal plus an additional buffer of 8 to 10 feet outside the fence. After the vegetation is cleared, the area would be graded to a level surface as needed, and drainage design implemented. A soil sterilizer would be applied to prevent regrowth of vegetation, and four to six inch layer of crushed rock laid down resulting in a permanent loss of vegetation for the footprint of the terminal site. For the Northern Terminal, Project-related activities would result in the conversion of 270 acres of mixed vegetation types to grass/forb-dominated vegetation in the short term, and the long-term loss of 234 acres of vegetated land over the lifetime of the project. Herbaceous wetland and greasewood flat areas would be temporarily impacted by construction activities, and permanently impacted by the placement of surface facilities in each of these areas. The conversion and loss of vegetation also would impact the quantity and arrangement of surface fuels, resulting in both temporary and long-term impacts to fire regime condition classifications within the area.

Indirect effects associated with construction of the Northern Terminal would include the potential spread and establishment of noxious and invasive weed species, changes in surface fuels due to establishment and growth of annual species, erosion and sedimentation, and fugitive dust generation. Following surface disturbance activities, noxious weeds and invasive species may readily colonize areas that have minimal vegetation cover. It is anticipated that populations of weedy annual species (e.g., halogeton, cheatgrass) may become established in localized areas for extended periods of time. The establishment of weedy annual species may lead to buildup of fine fuels that ignite readily and are consumed rapidly. Noxious weed invasions into disturbed areas may result in incremental changes to the FRCC for each vegetation community. These changes may result in landscape altercations that shift FRCC 1 classified communities into FRCC 2 or 3. These alterations may result in fire frequencies departing from their natural frequencies.

Following completion of Northern Terminal construction, 270 acres of disturbed land would be immediately reclaimed pursuant to TWE's Final POD. Reclamation would consist of re-grading, mitigating soil compaction, and preparing areas for seeding and revegetating in accordance with land management agency or private landowner requirements. TWE has committed to the development of a Wetlands and Waters of the U.S. Plan as part of the CWA 404 Permit, which would include measures to avoid and minimize impacts to wetlands and WUS to the extent practical. If wetlands are impacted by the project, mitigation measures would be developed through the CWA 404 permitting process. At the end of the useful life of the project, decommissioning would occur, the facilities would be dismantled and removed and the entire terminal site would be reclaimed.

The applicant has committed to the following design features (i.e., environmental protection measures) to mitigate impacts to the Project.

- TWE Design Features - TWE-19 (Erosion Control Plan), TWE-26 (Vegetation Management Plan and Noxious Weed Management Plan), TWE-20 (As part of the CWA 404 Permit, development of a Wetlands and Waters of the U.S. Plan to avoid and minimize impacts to wetlands and WUS to the extent practical), TWE-21 (NPDES Permit), TWE-22 to TWE-25 (Mitigation for runoff and limits to impacts near waterbodies), TWE-29 (Biological Protection Plan), TWE-58 (development of a Pesticide Use Plan), and TWE-64 (Fire Protection Plan).

Additional environmental protection measures that would apply to the project include the WWEC performance standards (i.e., BMPs) which are listed in **Appendix C**. Also listed in **Appendix C** are the NSU and CSU restrictions, which include restrictions for surface disturbance around wetlands, riparian areas, and drainages. A brief overview of the WWEC performance standards applicable to vegetation resources are listed below:

- WWEC performance standards – VEG-1 (restoration must use weed-free native species), VEG-3 (pesticide use), ECO-1/ECO-2/ECO-4/ECO-6 (protection of sensitive and unique habitats), ECO-3/ECO-5 (in consultation with USACE and in accordance with permit requirements, delineate and avoid, minimize or mitigate impacts to wetlands and riparian areas); FIRE-1/FIRE-2 (fire management and fuels buildup strategies); REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours), and REST-2 (restoring vegetation to values commensurate with the ecological setting), WAT-9 (erosion controls), WAT-7 (development of SWPPP), WAT-10 (minimization of stream crossings), AIR-1/AIR-2 (fugitive dust control).

Individual BLM FOs have field office-specific BMPs, and USFS forests have forest-specific stipulations and guidelines, that will apply to the project within the boundaries of each FO and forest. Where there is conflict with the WWEC performance standards, and individual BLM or USFS FO BMPs and stipulations and guidelines, the requirements of the individual offices will supersede the WWEC performance standards. Example of agency BMPs specific to vegetation resources include:

- Fugitive dust abatement techniques;
- No surface disturbing activities within a specified distance of riparian areas and wetlands;
- Erosion control methods; and
- Reclamation standards, including seed mix requirements, noxious weed control, and fencing to limit herbivory.

In addition, the following are proposed mitigation measures for vegetation, wetlands and riparian areas, and noxious weeds:

VG-1*: Native seed mixes to be used for reclamation would be developed in consultation with the land managers for the various regions crossed by the Project. Seed mixes would meet the requirements of the individual agency FO's crossed by the Project. Site-specific seed mixes for soils with low reclamation potential (LRP) would be developed. The LRP seed mixes would be specifically designed for alkaline, saline, or sodic soils and would be used in areas where reclamation would potentially be difficult based on soil conditions. Additional soil amendments may be required in these areas, and would be implemented at the direction of the land manager.*

WET-1*: Wetland surveys would be conducted at terminal, ROW, ancillary facilities, and along proposed access roads corridors to identify wetland, WUS, and riparian areas located in these areas. Survey information collected would include wetland type, type and cover of hydrophytic and riparian vegetation species present, soil characteristics, site hydrology, global positioning system location of the wetland, and associated information required to determine jurisdictional status. Based on survey results, no surface disturbance including temporary and permanent facilities, the placement of fill material or vegetation clearing for storage, parking, construction activities, or construction work areas as feasible will occur within the avoidance buffer, or surface use restriction defined in the resource management plan for each BLM FO and USFS national forest. If avoidance is not feasible, USACE, BLM, USFS, USFWS crossing and construction techniques for wetlands and riparian areas will be employed. The wetland crossing and construction techniques will be approved by the USACE, BLM, USFS, and USFWS and will be outlined in the Final POD.*

WET-2*: For any features identified during field surveys as jurisdictional under the USACE and EPA guidance under Section 4 of the Clean Water Act, consultation with the USACE will occur prior to construction. Mitigation for these features will be determined in consultation with the USACE and BLM.*

NX-1*: The noxious weed management plan to be developed as part of the Construction, Operation and Maintenance (COM) Plan would include the following:*

1. *Pre-construction surveys for noxious weeds in the footprints of the ROW, access roads, and ancillary facilities;*
2. *Pre-construction weed control;*
3. *Education of construction and operation personnel in each project region;*
4. *Washing of vehicles and equipment before entering and leaving the ROW;*
5. *Herbicide spraying; and*
6. *Annual monitoring and reporting.*

Survey information collected during pre-construction surveys would include species name, global positioning system location of weed infestations, percent cover, and approximate size of weed infestations. Control of noxious and invasive species could include chemical, physical, and biological methods and will be developed in consultation with the land agencies and private landowners. The plan will identify species of concern for each BLM FO and USFS forest, and focus monitoring and control methods on these species. The plan would comply with the existing BLM, USFS, USFWS, state, and federal regulations concerning noxious weed management.

***NX-2**: Herbicide spraying would be conducted following all applicable state and federal laws regarding chemical use, adverse weather, chemical storage, and chemical drift. Further guidelines and protocols for herbicide spraying on BLM land is provided in the Final BLM Vegetation Treatment Using Herbicides Programmatic EIS (BLM Vegetation EIS) (BLM 2007). Standard operating procedures for herbicide spraying include buffers for sensitive areas such as riparian and wetland areas and threatened and endangered species habitat, timing restrictions, and safety protocols.*

***NX-3**: On lands managed by the BLM, an approved Pesticide Use Proposal (PUP) would be obtained from each BLM FO prior to herbicide spraying. PUPs would have site-specific information about the herbicides to be used. The PUPs and associated reporting requirements would be submitted on the schedule required for each BLM FO. Herbicide spraying in desert tortoise habitat in Nevada would require consultation with the BLM and USFWS.*

Effectiveness: Implementation of mitigation measure **VG-1**, as well as BMPs and design features would aid in reclamation activities and restoring communities to native ecosystems, especially in areas where reclamation is difficult. Implementation of mitigation measures **WET-1** and **WET-2** would help minimize or avoid direct and indirect impacts to wetlands and riparian areas resulting from construction and operation of the Northern and Southern Terminals. Implementation of **NX-1** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive species, and control the methods used to treat noxious and invasive species. WWEC VEG-3 ensures herbicide use be in compliance with agency policies, and be applied in a manner consistent with label directions and state pesticide regulations. **NX-2** and **NX-3** would ensure compliance BLM standards for herbicide use on BLM lands.

While mitigation measures, BMPs, and design features would increase reclamation success, in areas of temporary disturbance the loss of woody-dominated vegetation related to construction activities would represent a long-term impact, as it would take up to 10 to 25 years following reclamation for mature shrub species to re-establish, and 30 to 50 or more years for re-establishment of mature woodlands. Through the implementation of mitigation measures, direct impacts to wetlands and riparian areas would be avoided, and the spread of noxious weeds would be minimized.

<u>Southern Terminal</u>

Construction of the Southern Terminal would result in surface direct disturbance effects to 412 acres of vegetation. **Table 3.5-10** identifies estimated acreage of project-related surface disturbance by vegetation cover type within the Northern and Southern Terminal locations. The Southern Terminal is located in only

two vegetation community types (Desert Shrub and Developed/Disturbed). The majority of the disturbance in the Southern Terminal would occur in the Developed/Disturbed community type.

Surface disturbance activities and site clearing operation and decommissioning impacts associated with the Southern Terminal would be identical to those associated with the Northern Terminal. Since the predominant cover type within the Southern Terminal area is developed/disturbed, no direct impacts to vegetation resources are anticipated. As with the Northern Terminal, indirect effects associated with construction of the Southern Terminal include the spread and establishment of noxious and invasive weed species, erosion and sedimentation, and fugitive dust generation.

Conclusion: As the majority of the construction and operations disturbance would occur on already developed/disturbed vegetation cover type, direct impacts to vegetation, wetlands, and fire would not be anticipated. Indirect impacts associated with vegetation, wetlands, and noxious weeds would be similar to those discussed for the Northern Terminal. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts.

Southern Terminal Alternative

Construction of the Southern Terminal Alternative location would result in surface direct disturbance effects to 412 acres of vegetation. **Table 3.5-10** identifies estimated acreage of project-related surface disturbance by vegetation cover type within the Northern and Southern Terminal Siting Areas. The Southern Terminal Alternative is located in the same siting area as the Southern Terminal. Within the site for the Southern Terminal Alternative are two vegetation community types (Desert Shrub and Developed/Disturbed). The majority of the disturbance in the Southern Terminal Alternative would occur in the Developed/Disturbed community type.

Surface disturbance activities and site clearing operation and decommissioning impacts associated with the Southern Terminal Alternative would be identical to those described for the Northern Terminal. Since the predominant cover type within the Southern Terminal area is developed/disturbed, no direct impacts to vegetation resources are anticipated. Indirect impacts to vegetation, wetlands, and noxious weeds would be similar to those discussed for the Northern Terminal. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts.

Design Options

Design options would utilize the same alternative routes and construction techniques as the proposed Project. Impacts from construction and operation of this design option would be similar to those discussed under the alternative routes.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Differences between this design option and the proposed Project include the locations of the Southern Terminal near IPP, southern converter station and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The series compensation station would be located adjacent to the transmission line, and impacts are therefore disclosed within the description of the proposed Project routes. The southern converter station would be located near IPP in Utah instead of Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP. **Table 3.5-11** provides a summary of impacts associated with Design Option 2.

Construction and operation of a converter station near IPP, ground electrode system, and series compensation station would be similar to impacts described in Section 3.5.6.1, Impacts from Terminal Construction and Operation. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts resulting from Design Option 2. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Table 3.5-11 Summary of Design Option 2 Southern Terminal and Ground Electrode Site Impacts to Vegetation

	Design Option 2 Southern Terminal – Converter/Substation				Delta Ground Electrode Site			
	Construction Disturbance		Operation Disturbance		Construction Disturbance		Operation Disturbance	
Vegetation Communities	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area
Total	**181**	**<1**	**113**	**<1**	**131**	**<1**	**40**	**<1**
Agriculture	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	1	<1	<1	<1
Cliff and Canyon	-	-	-	-	<1	<1	<1	<1
Conifer Forest	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-
Developed/Disturbed	-	-	-	-	2	<1	1	<1
Dunes	-	-	-	-	-	-	-	-
Grassland	18	<1	11	<1	26	<1	8	<1
Greasewood Flat	17	<1	11	<1	18	<1	6	<1
Herbaceous Wetland	7	<1	4	<1	2	<1	1	<1
Montane Grassland	-	-	-	-	<1	<1	<1	<1
Montane Shrubland	-	-	-	-	<1	<1	<1	<1
Open Water	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	<1	<1	<1	<1
Riparian	-	-	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	11	<1	3	<1
Saltbush Shrubland	139	<1	87	<1	69	<1	21	<1
Tundra	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	<1	<1	<1	<1

Design Option 3 – Phased Build Out

Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed Project; however, construction would occur in phases as described in Chapter 2. Differences between this design option and the proposed Project include the construction of an interim substation and connection at IPP and a series compensation station midway between Sinclair, Wyoming and IPP that would operate during Phase I of the design option as described in Chapter 2.0. **Table 3.5-12** provides a summary of impacts associated with the interim substation under Design Option 3.

The total surface disturbance at a given time might be less depending on the timing and reclamation activities associated with the phased build out. Impacts from construction and operation of this design option would be similar as those discussed under the alternative routes below. The series compensation station would be located adjacent to the transmission line, and impacts are therefore disclosed within the description of the proposed Project routes below.

Table 3.5-12 Summary of Design Option 3 Substation Impact Parameters to Vegetation

Vegetation Communities	Design Option 3 Converter/Substation			
	Construction Disturbance		Operation Disturbance	
	Acres	% of Analysis Area	Acres	% of Analysis Area
Total	**171**	**<1**	**75**	**<1**
Agriculture	-	-	-	-
Aspen Forest and Woodland	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-
Cliff and Canyon	-	-	-	-
Conifer Forest	-	-	-	-
Deciduous Forest	-	-	-	-
Desert Shrub	-	-	-	-
Developed/Disturbed	1	<1	<1	<1
Dunes	-	-	-	-
Grassland	5	<1	2	<1
Greasewood Flat	96	<1	42	<1
Herbaceous Wetland	1	<1	1	<1
Montane Grassland	-	-	-	-
Montane Shrubland	-	-	-	-
Open Water	-	-	-	-
Pinyon-Juniper	-	-	-	-
Riparian	-	-	-	-
Sagebrush Shrubland	<1	<1	<1	<1
Saltbush Shrubland	68	<1	30	<1
Tundra	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-

Construction and operation of a substation and series compensation station would have similar impacts as those described in Section 3.5.6.1, Impacts from Terminal Construction and Operation and Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts resulting from Design Option 3. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

3.5.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

Construction-related surface-disturbing activities would occur in the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, and the ancillary facilities. In the ROW, surface-disturbing activities would consist of ROW clearing, installation of transmission line structures and wires, and construction of temporary and long-term facilities related to construction and operations. In the corridor, surface-disturbing activities would be related to the construction of temporary and long-term access roads. Acres of surface impacts are listed below under each of the Region's impact discussions.

Construction of the transmission line would occur concurrently with construction of terminals and ground electrode system construction. Prior to construction, sensitive environmental features to be avoided during

construction would be flagged. Direct surface disturbing impacts to vegetation would include the trampling/crushing of vegetation, the removal of vegetation, and soil compaction. Indirect effects to vegetation would include increased erosion, sedimentation, fugitive dust generation, the potential spread and establishment of noxious and invasive weed species, and habitat fragmentation.

Vegetation clearing in the ROW during construction would occur as described in the COM Plan, PDTR and associated framework summary of the draft Vegetation Management Plan (PDTR, **Appendix D**). Based on the draft plan, vegetation clearing during construction would be stratified by vegetation height. Vegetation over 6 feet in height would be cleared or removed as described below. Vegetation over 6 feet in height predominantly would include trees and larger shrub species found in the following vegetation community types: Aspen Forest and Woodland, Conifer Forest, Deciduous Forest, Pinyon-Juniper, and Woody Riparian and Wetlands. Low-growing trees, shrubs, and ground vegetation under 6 feet in height would be left in place. Trees to be cleared would be cut off at ground level, and the stumps left in place for erosion control. Vegetation would be removed using mechanical means appropriate for the area. Marketable timber removed from the ROW would be purchased from the appropriate land management agency or private landowner. Slash would be removed from the ROW or chipped and spread according to approved land agency practices. The depth of wood chips spread over the ROW after vegetation clearing activities could impact vegetation and soil resources in the ROW. Spreading wood chips at a 3-inch depth could increase soil temperature in the winter, moderately increase soil moisture, and substantially decrease soil nitrogen supply and understory vegetation. The increase in soil temperature and soil moisture would have relatively minor ecological effects. However, reductions in the soil N supply may temporarily reduce productivity of the soil and affect revegetation rates (Binkley et al. 2003). With increasing depth of mulch, these impacts will increase in magnitude and duration. As access is needed to the ROW during construction activities, the remaining vegetation not removed during clearing would be driven over resulting in trampling and/or crushing of the vegetation. This would leave the root stock and topsoil in place in the majority of the ROW. Leaving the root stock and topsoil in place would allow the vegetation in the ROW to resprout from the existing seed bank and root stock. The removal of woody vegetation over 6 feet in height could result in changes in vegetation community structure, through increases in the amount of light and open areas in the ROW. Depending on the species present, and the length of time for the woody species to re-establish in the ROW, woody communities could temporarily or permanently shift to communities dominated by herbaceous and/or low growing shrubs. In addition, increased light and open areas in the ROW could lead to increased noxious and invasive weed species establishment and spread.

For any routes that cross IRAs, special construction and maintenance methods are proposed (see **Appendix D**, Section D.3.8.3). A 100-foot-wide construction ROW would be used to install the transmission line through these areas. Within the construction zone, vegetation clearing, and grading would be the same as in the non-IRA portion of the ROW. Construction in IRAs would occur over a shorter time frame (6 to 9 months) and helicopter construction methods may be used to the extent practical.

Biological soil crusts damaged during construction activities could affect the health and successful restoration of native vegetative communities. See Section 3.3, Soils, for further discussion of impacts related to compaction and topsoil. Wetlands would be avoided to the extent practical.

Indirect impacts from ROW clearing could include increased runoff, erosion, and sedimentation; potential spread and establishment of noxious and invasive species, herbicide drift, changes in the quantity and arrangement of surface fuels, and changes in surface runoff from additional surface disturbance. The amount of vegetation impacted by indirect impacts as a result of project implementation would vary depending on the type of indirect disturbance. Typically, indirect impacts occur 100 to 300 feet away from the construction impact, but could affect vegetation communities further away such as through increased sedimentation into drainages affecting communities downstream (USFWS 2013).

Construction activities may increase erosion and sedimentation, and modify the floodplain surface as well as channel beds and banks. These effects may create indirect impacts on nearby riparian vegetation or directly affect habitat for wildlife and endangered fish, adversely impact water quality, and may adversely affect

wildlife and plant species further downstream. Following surface disturbance activities, noxious weeds and invasive species may readily colonize areas that have minimal vegetation cover. It is anticipated that populations of weedy annual species (e.g., halogeton, cheatgrass) may become established in localized areas for extended periods of time. The establishment of weedy annual species may lead to buildup of fine fuels that ignite readily and are consumed rapidly. Noxious weed invasions into disturbed areas may result in incremental changes to the FRCC for each vegetation community. These changes may result in landscape alterations that shift FRCC 1 classified communities into FRCC 2 or 3. These alterations may result in fire frequencies departing from their natural regime.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1**, **VG-2**, and **VG-3** would mitigate impacts to the natural fire regime of these communities.

Accidental wildfires ignited as a result of construction activities could affect vegetation communities in a variety of ways. Impacts may include, but are not limited to, the following: partial to complete removal of aboveground plant cover and belowground components (e.g., roots, rhizomes, and seed bank); soil moisture loss and possible subsequent hydrophobic soil; loss of cacti, yucca, and special status plant species and/or their associated habitats; propensity to increase the spread or introduction of noxious and non-native invasive weed species; and loss of suitable habitat for wildlife and grazing animals.

The land cover type with the highest overall risk of accidental fires spreading upon ignition is sagebrush shrubland. The risk of fire spread in the sagebrush cover type would largely depend on the shrub interspaces and the cover of the herbaceous understory in any given area. Wide interspaces among shrubs and low herbaceous cover would limit fire spread whereas dense sagebrush shrub stands, and/or extensive herbaceous plant cover could increase the risk of fire spread. Post-wildfire revegetation to a pre-disturbance baseline structure and composition may vary depending on physical, environmental, and physiological factors such as the severity, intensity, and duration of the wildfire; extent of disturbance; topography; slope; soil moisture; precipitation; and sensitivity of the impacted species. Vegetation cover type recovery time frames would be generally consistent with those described above for post-construction reclamation.

Temporary work areas would be located within the 2-mile transmission line corridor, and would include staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures. The portion of surface disturbance associated with each of a these areas varies. Staging areas, fly yards, batch plant sites would be, to the extent possible, co-located in areas that are previously disturbed or areas of minimal vegetation to minimize surface disturbance. The vegetation in these areas would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, as well as and structure work areas, would be completely cleared of vegetation during construction. The applicant would locate wire pulling, tensioning, and splicing sites such that clearing and blading activities would be minimized to the extent practical. The work area to be cleared around the each structure would depend on the type of structure (e.g., guyed lattice structures, tubular steel pole, and self supporting lattice structures) installed.

Within the ROW and corridor, temporary and long-term access roads would be required to provide surface access to all structures and work areas. To minimize disturbance, existing access roads would be utilized wherever practical. Existing roads would be improved as necessary. Non-graded overland access would be used where terrain and soil conditions are suitable. Vegetation along existing access roads would be affected (e.g., reduction in growth rate) as a result of dust deposition. No access roads are proposed in IRAs.

Where access to structures or work areas is prohibited by lack of existing roads, or where topographic conditions prohibit safe overland access to the site, new access roads would be constructed. To limit surface disturbance from construction of new access roads, the new roads would be located within the

ROW where practical, and sited to minimize potential environmental impacts. An access road plan would be developed during engineering and design, which would define site-specific access. Access roads would be constructed in accordance with AASHTO standards and guidelines, and BLM, USFS, and county road requirements on public lands. Water crossings to be implemented for access roads are described in the PDTR (**Appendix D**).

Direct surface disturbance impacts from access road construction would include vegetation trampling/crushing, vegetation removal, grading, and compaction. Indirect impacts from access road construction would include increased erosion, sedimentation, fugitive dust generation, the potential spread and establishment of noxious and invasive weed species, and habitat fragmentation. In the corridor, outside of the ROW, construction impacts would be limited to the construction of access roads. The linear construction surface disturbance-related activities can result in increased introduction and/or spread of noxious weeds and invasive species within adjacent areas. In areas where there are already extensive infestations of noxious weeds, noxious weed control during construction, operation, and maintenance activities could be difficult due to the large local seed source.

Linear surface disturbances such as those associated with transmission lines and roads can and have provided corridors (Gelbard and Belnap 2003; Watkins et al. 2003) and serve as a source of propagules (D'Antonio et al. 2001) for further spread of noxious and invasive species into adjacent undisturbed areas. Localized surface disturbances can facilitate the invasion of noxious and invasive species by removing native vegetative cover, creating areas of bare ground (Burke and Grime 1996; Watkins et al. 2003), and increasing light and nutrient availability (Stohlgren et al. 2003, 1999). Noxious and invasive weed species compete with native plants, can degrade and modify native communities, and reduce resources for native species (e.g., moisture, soil nutrients, and light).

Landscape fragmentation would result from the development of the access road network, facilities, and transmission line towers. Landscape fragmentation is defined as the transformation or break-up of large patches of continuous, connected areas into a number of patches of smaller total area, that are isolated from each other. Landscape fragmentation, through the construction of access roads, utility corridors, and facilities, breaks up native habitats into smaller units separated by areas of disturbance, or different habitat types. Landscape fragmentation can result in loss of habitats, increased edge effects, effects on sensitive species populations, and increased competition from noxious and invasive weed species. Surface disturbance and associated landscape fragmentation increases the potential for noxious weed and invasive species to spread and establish proportionate to the amount of disturbance.

Fire regimes in vegetation communities modified by construction activities would be altered. Cover type conversions, the removal or rearrangement of canopy and surface fuels, the temporary creation of localized areas devoid of vegetation or firebreaks, and colonization of disturbed areas by annual invasive species would result in altered fire regime condition classes at facility locations and within vegetation communities within the ROW. The majority of the facilities sites would be located in the ROW, while the terminal and ground electrode facilities would be located outside this 2-mile-wide transmission line corridor.

Impacts to vegetation from reclamation would be similar to those described under Section 3.5.6.1, Impacts from Terminal Construction and Operation. In IRAs, areas disturbed in the construction zone would be re-contoured, the topsoil replaced, and revegetated per USFS requirements and the Vegetation Management Plan. Areas disturbed and reclaimed in the IRAs would be monitored for 3 to 5 years, in accordance with USFS requirements. For all areas disturbed and reclaimed, a general mitigation monitoring plan would be developed as part of the COM Plan that would address how each mitigation measure would be monitored for compliance, as described in the PDTR (**Appendix D**). Reclamation of the vegetation communities back to their native diversity and composition would vary across the ROW and corridor due to various factors such as soil mixing, timing and duration of disturbance, topography, slope, soil moisture, and precipitation. Reclamation standards for the project would vary by the requirements defined by each land management agency crossed by the project. In general, reclamation success is defined as re-establishing a self-sustaining, diverse vegetation community composed of species native to the region in sufficient species

density and diversity to closely approximate natural, undisturbed vegetation potential. In herbaceous communities, reclamation is often determined by the establishment of adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations.

It is estimated that overall, herb-dominated plant communities would require a minimum of 2 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations. Woody-dominated plant communities would require at least 10 to 25 years for shrubs to recolonize the area while re-establishment of mature woodlands would require at least 30 to 50 or more years. Depending on the composition and topography of existing woodlands, recovery could take up to 80 to 100 years to achieve mature trees of similar stature to pre-construction conditions. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, successful reestablishment of native vegetation may require additional measures, and take a longer timeframe. The success of woodland re-establishment could be impacted by co-located disturbances and adverse environmental conditions including wildfire, drought, climate change, insects, and disease (Folke et al. 2004; Loehman et al. 2011). Wildfire in combination with adverse environmental conditions could result in woodlands converting to shrubland communities over time.

In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term, and may not be successful (10 to 100 years depending on the community structure). Some plant communities may not return to pre-construction conditions due to alteration of soil communities, noxious weed invasion, and loss of biological soil crusts. The implementation of additional reclamation techniques such as minimization of surface disturbance, soil amendments, and noxious weed control may be required in these areas to achieve successful reclamation. Areas with soil reclamation constraints are identified in Section 3.3, Soils.

The implementation of BMPs and design features would be the same as described under Section 3.5.6.1, Impacts from Terminal Construction and Operation. Additional Project design features to be implemented include:

- TWE Design Features TWE-9/TWE-10 (restrict travel to pre-designated areas, access or public roads), TWE-11/TWE-27 (where re-contouring not required, vegetation will be left in place wherever possible), TWE-12 (no widening or upgrading of existing access roads in areas sensitive to disturbance), TWE-13 (restoration of temporary work areas), TWE-14 (borrow pits), and TWE-28 (clearing will be minimized to extent possible).

Additional WWEC BMPs that would apply to the project include:

- WWEC BMPs – VEG-2 (integrated vegetation management plan development), SOIL-1 (topsoil salvage), SOIL-2 (slopes), WAT-10 (minimize stream crossings), and WAT-11 (erosions controls at drainage crossings).

Each BLM FO and USFS Forest has specific surface disturbance avoidance buffers for riparian and wetland areas. Examples of NSU and CSU restrictions that apply to wetland and riparian resources include:

- Rock Springs FO – 500 feet from surface water, perennial streams, riparian areas, and wetlands. Surface disturbing activities will be avoided within 100 feet from the inner forge of ephemeral channels.
- Little Snake FO – NSO stipulations for up to 0.25 mile from perennial water sources, if necessary, depending on type and use of the water source, soil type, and slope steepness.

- Las Vegas FO – Protect artificial and natural waters that provide benefit to wildlife by providing a minimum buffer of 0.25 mile for permitted activities (such as for off-road vehicle events).
- Uinta National Forest – 300-foot buffer associated with major drainages where volumes of base water flows are at least 10 cubic feet per second (cfs).

Examples of agency BMPs specific to vegetation resources would be the same as described in Section 3.5.6.1, Impacts from Terminal Construction and Operation. The following mitigation measures are proposed to minimize impacts to vegetation, to wetlands and riparian areas, and from noxious weeds:

VG-2*: Woody areas such as pinyon-juniper, which are on average taller than the 6 feet minimum clearance, but with wide spacing between the trees allowing vehicle and equipment access to the transmission line ROW, would not be cleared during construction activities. This measure would consider conductor clearance requirements.*

VG-3*: A vegetation reclamation and monitoring plan will be developed as part of the Construction, Operation, and Maintenance (COM) Plan. The reclamation monitoring plan would define reclamation success for each vegetation type and management agency, list reclamation seed mixes, and detail reclamation monitoring for both interim and final reclamation. Interim and final reclamation success would be monitored quarterly for the first year, and then annually for at least three years, or until reclamation success as defined by each land management agency crossed by the project is achieved. Reporting of construction, reclamation progress, and monitoring results would be submitted to each land management agency per each office's reporting requirements.*

VG-4*: During vegetation clearing, if chipping and spreading woody material in the ROW, wood chips will not exceed 3 inches in depth. Distribute chips in discontinuous patches that do not result in a continuous chip mat (<40% of surface covered by 3 inches of chips).*

VG-5*: Masticated material spread in the ROW will not exceed a depth of 3 to 6 inches. Distribute material in discontinuous patches that do not result in a continuous chip mat (less than 40 percent of surface covered 3 to 6 inches thick.*

NX-4*: The cut-stumps of mature salt cedar stands that are cut as part of vegetation clearing will be immediately painted with herbicides. The specific control methods, and herbicide to be used will be determined in consultation with the Nevada BLM State and FOs. Additional control measures could the planting of native or desired plant species following treatment to provide erosion control, and the use of biocontrols.*

WET-3*: Access roads will be routed around riparian areas, wetlands, intermittent or perennial drainages, and ephemeral channels to the extent practical. If jurisdictional wetlands or WUS cannot be avoided, USACE approved construction techniques for construction in wetlands and WUS will be applied. BLM and USFS construction techniques for non-jurisdictional wetlands, riparian areas, intermittent drainages, and ephemeral channels would be applied on BLM and USFS lands, as appropriate. These include the use of timber mats, erosion controls, and the placement of equipment outside of the wetland, riparian areas, intermittent drainages, and ephemeral channels boundaries.*

Effectiveness: By minimizing the number of trees cut or removed, mitigation measure **VG-2** would diminish the impacts of construction-related activities to woodlands in the Project ROW. **VG-3** would define the reclamation requirements, seed mixes to be used for reclamation, and reclamation success monitoring to be conducted by the applicant. **VG-4** and **VG-5** would mitigate impacts to soil and vegetation resources from the spreading of chipped and masticated material in the ROW as part of vegetation clearing activities. **NX-4** would improve the control and management of salt cedar stands that are to be cleared as part of the construction and maintenance activities. Implementation of mitigation measure **WET-1** through **WET-3**, in conjunction with design feature TWE-20 (as part of the CWA 404 Permit, development of a Wetlands and

Waters of the U.S. Plan to avoid and minimize impacts to wetlands and WUS to the extent practical), would mitigate impacts to wetlands and riparian areas through identification and mapping of wetlands, riparian areas, and drainages, and the avoidance of surface disturbance in these areas. For access roads, where avoidance of wetland, riparian areas, and drainages is not feasible, mitigation will be applied as directed in **WET-3** to minimize impacts.

Project-related activities would result in the conversion of tree-dominated vegetation communities to shrub- and grass/forb-dominated vegetation in the short and long-term. Long-term impacts would include the loss of vegetation from long-term facilities (structure footprints and roads) during the life of the project; other disturbed areas would be reclaimed immediately following completion of construction.

Through the implementation of mitigation measures **VG-1** and **VG-2**, direct impacts to woody vegetation would be minimized. The loss of woody-dominated vegetation related to construction activities would represent a long-term impact. Implementation of **WET-2** and **WET-3** would minimize or avoid direct and indirect impacts to wetlands and riparian areas due to construction. Implementation of **NX-1** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive species, through the development of the Noxious Weed Management Plan and identification of noxious weed species of concern in the ROW and ancillary facilities during annual monitoring. The Noxious Weed Management Plan would identify control and prevention methodologies and techniques to be implemented during the construction, reclamation, operation, and decommissioning phases of the proposed Project.

If wetlands and riparian areas cannot be avoided, potential construction impacts may include, but are not limited to, clearing of all vegetation, topsoil handling during construction and restoration, and potential temporary disturbance of the surface and subsurface hydrology. If drainages cannot be avoided, construction impacts may include erosion and sedimentation of stream channels, and the introduction of contaminants into flows and/or existing channel sediments. Cuts-and-fills at streams associated with access road crossings or other project features may affect the extent and cross-sectional geometry of drainages. The extent of impacts would depend on presence of water at the time of construction, channel crossing methods, erosion controls during construction, and the subsequent success of reclamation and stabilization. To minimize impacts at stream crossings, TWE would apply design features TWE-20 to TWE-25. Potential post-construction impacts may include alteration of vegetation composition resulting from the establishment of noxious weeds and invasive plant species.

Operation and Maintenance Impacts

Operation and maintenance impacts include the permanent loss of vegetation due to facility, structure, and access road footprints, maintenance activities in the ROW, and increased use of access roads. Acres of operation-related surface impacts are listed under each of the Region's specific impact discussions below.

Vegetation maintenance for the ROW would be defined by the Vegetation Management Plan. The development of a Vegetation Management Plan is a requirement of NERC reliability standard FAC-003-02. NERC reliability standard FAC-003-2 is focused on preventing vegetation-related outages from occurring on transmission lines. The Vegetation Management Plan would define levels of maintenance and would be developed during Project engineering and design as part of the COM plan. Based on the current draft plan (PDTR Volume I **Appendix D**), maintenance activities would be stratified into three categories for management (Levels I, II, and III). Level I would be applied to the majority of the ROW, while Levels II and III, due to their increased cost and maintenance, would only be applied to areas identified as sensitive based on biological, cultural, visual, or other characteristics. The definitions and specific details of the individual management levels are explained in the PDTR Volume I and **Appendix D**.

Level I is the standard ROW vegetation management category that would be applied across the majority of the ROW. Vegetation would be maintained to achieve stable, low-growth plant communities that would be free of noxious or invasive plants and comprised of herbaceous plants and low-growing shrubs. The desirable condition for this standard is vegetation heights averaging 3 feet in height, ranging between 2 and

6 feet. Vegetation debris and density would be assessed to determine wildfire risks, and additional mitigation. Level II and III measures are treated as the same vegetation maintenance plan for impact analysis. These activities would be applied in sensitive and constrained areas as defined by the permitting agencies. Level II and Level III maintenance activities would be applied to the crossings of riparian vegetation to mitigate impacts from maintenance activities in riparian areas. Any direct maintenance activities that occur in the wetlands or riparian areas could impact wetlands and other WUS and may require USACE consultation.

The desired condition is defined by the Wire Border Zone concept, and defines two zones (wire zone, and border zone) for vegetation management in the ROW. The wire zone is defined as the section of the utility ROW that is directly under the wires and extends outward a distance sufficient to accommodate anticipated wire movement (90 feet in width centered on the centerline of the transmission line). Within the wire zone, vegetation maintenance would be the same as for Level I. The border zone extends 80 feet from the wire zone boundary to the ROW boundary. The desired condition within the border zone is stable low-growth vegetation consisting of small trees and large shrubs, and herbaceous vegetation. The maximum height in the border zone varies from 25 feet to 35 feet. In canyons, or low-lying valleys, and depending on growth and density characteristics of individual trees, taller vegetation might be allowed.

In IRAs, maintenance activities would be conducted using aircraft, non-motorized methods, or by approved all terrain vehicles. For emergency repairs, or to maintain NESC electrical line clearance, motorized vehicles potentially would be used. Active vegetation management would occur in a limited ROW width for the life of the project.

Noxious weed and invasive species impacts could result from maintenance activities and increased use of access roads. Maintenance activities can aid in the mechanical transport of propagules from outside the ROW. Removal of taller vegetation can create open patches of vegetation and bare ground and facilitate the invasion of noxious and invasive species and increase light and nutrient availability (Burke and Grime 1996; Stohlgren et al. 2003, 1999; Watkins et al. 2003). Mitigation measures and their effectiveness are the same as described for construction activities.

Vegetation management levels would be applied as temporary use areas cleared during construction are successfully reclaimed once construction activities are completed. Mitigation measure **VG-2** is recommended to be implemented during operation activities to mitigate impacts to pinyon-juniper communities and other wooded areas with trees that are widely spaced.

Removal of fuels along the power lines through vegetation management would reduce the hazard of wildland fire caused by power line malfunction. The removal of hazardous trees and fuels in a linear fashion along the power line ROW would create a zone of disturbed fuels in the event of power line discharge or arcing. With little or no vegetation and forest fuels to sustain a fire, an arc from the power line would not likely be able to ignite a fire event. Indirectly, removal of hazard trees and fuel loads along the power lines may prevent power line damage from wildfire by moving the sources of heat and flame away from power lines and power line structures, thus preventing power failure.

In areas where removal is not feasible or possible, fuel treatments such as mastication, chipping, or lopping and scattering would be used to reduce overhead hazards; however, these methods would do little to slow or prevent fire movement to the power line structures. These fuel treatments are designed to place as much of the fuel as possible in direct contact with the ground to facilitate decay through increased moisture retention, potentially lessening the intensity of a fire situation over time while providing increased access for firefighters.

The response and revegetation potential of each vegetation type varies depending on actual fire conditions, the seasonal timing, pre- and post- fire vegetation, elevation and post-fire weather patterns. Vegetation in cool fire areas (for example areas where native perennial bunchgrass cover and site productivity are high) can frequently revegetate naturally without seeding. Hot fires in areas with dense sagebrush or

pinyon-juniper stands can result in scorched, water-resistant soils that become unproductive until the condition changes, which could take several years. Extremely severe fires have been known to sterilize soils and lead to the permanent loss of productivity.

Decommission Impacts

Decommissioning activities would include the removal of facilities, and the reclamation of the ROW, access roads, and ancillary facilities. Impacts would be similar to those as discussed for construction activities, except that removal of vegetation would not be required as part of decommissioning. The same BMPs and design features and mitigation measures would be applied to reduce impacts during decommissioning activities. See **Appendix D** for more details on decommissioning activities.

3.5.6.3 Region I

Impact areas in the regional table are split between ROW clearing/trampling and facilities. Clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height, and driving over the vegetation with construction equipment. Facilities would include access roads; temporary work areas such as staging areas, material storage yards, fly yards, drilling, fencing, and splicing sites; batch plant sites; and guard structures within the 2-mile transmission line corridor. **Table 3.5-13** provides a comparison of impacts associated with the alternative routes in Region I.

Alternative I-A (Applicant Proposed)

Key Parameters Summary

In Alternative I-A the majority of the disturbance would occur in the sagebrush and saltbush shrubland vegetation community types. Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. The route follows I-40 for a considerable portion of the line's length in Colorado. This area historically has been disturbed. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 43 acres of pinyon-juniper, and 28 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities. Implementation of **VG-1** would mitigate impacts to saltbush communities, and other areas that may be difficult to reclaim to pre-disturbance native vegetation conditions. Implementation of mitigation measure **VG-2** would mitigate impacts to pinyon-juniper communities along the ROW, and decrease the amount of area to be cleared. Implementation of **VEG-3** would assist in ensuring post-reclamation success through monitoring and reporting of reclamation results. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 21 acres of greasewood flat, 23 acres of herbaceous wetlands, and 16 acres of woody riparian and wetlands. Of this, 6 acres of greasewood flat, 5 acres of herbaceous wetlands, and 4 acres of woody riparian and wetland areas would be impacted by operation impacts. Specific herbaceous wetland and riparian types along Alternative I-A include wet meadows, fens, and wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative I-A would include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation of **WET-1** through **WET-3** would mitigate impacts to wetland and woody riparian and wetland areas, as described in Section 3.5.6.1 and Section 3.5.6.2.

Table 3.5-13 Summary of Region I Alternative Route Impacts for Vegetation

	Construction Disturbance								Operation Disturbance							
	Alternative I-A		Alternative I-B		Alternative I-C		Alternative-I-D		Alternative I-A		Alternative I-B		Alternative I-C		Alternative I-D	
Vegetation Communities	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I
Total	**3,242**	**<1**	**3,304**	**<1**	**3,848**	**<1**	**3,500**	**<1**								
ROW Clearing/Trampling[1]																
Agriculture	20	<1	28	<1	356	<1	28	<1	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	19	<1	15	<1	6	<1	11	<1	-	-	-	-	-	-	-	-
Cliff and Canyon	16	<1	29	<1	7	<1	14	<1	-	-	-	-	-	-	-	-
Conifer Forest	1	<1	1	<1	1	<1	1	<1	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/Disturbed	81	<1	80	<1	95	<1	95	<1	-	-	-	-	-	-	-	-
Dunes	26	<1	<1	<1	<1	<1	1	<1	-	-	-	-	-	-	-	-
Grassland	146	<1	128	<1	275	<1	128	<1	-	-	-	-	-	-	-	-
Greasewood Flat	29	<1	123	<1	38	<1	63	<1	-	-	-	-	-	-	-	-
Herbaceous Wetland	37	<1	23	<1	4	<1	46	<1	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	1	<1	-	-	-	-	-	-	-	-	-	-
Open Water	3	<1	3	<1	3	<1	3	<1	-	-	-	-	-	-	-	-
Pinyon-Juniper	43	<1	45	<1	46	<1	45	<1	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,921	<1	1,826	<1	2,616	<1	2,198	<1	-	-	-	-	-	-	-	-
Saltbush Shrubland	872	<1	974	<1	377	<1	84	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	28	<1	29	<1	23	<1	24	<1	-	-	-	-	-	-	-	-
Facilities[2]																
Total	**2,057**	**<1**	**2,083**	**<1**	**2,511**	**<1**	**2,306**	**<1**	**526**	**<1**	**495**	**<1**	**618**	**<1**	**531**	**<1**
Agriculture	14	<1	19	<1	254	<1	19	<1	4	<1	5	<1	68	<1	5	<1
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	11	<1	10	<1	4	<1	7	<1	3	<1	2	<1	1	<1	2	<1
Cliff and Canyon	11	<1	19	<1	4	<1	9	<1	3	<1	5	<1	1	<1	2	<1

Table 3.5-13 Summary of Region I Alternative Route Impacts for Vegetation

	Construction Disturbance								Operation Disturbance							
	Alternative I-A		Alternative I-B		Alternative I-C		Alternative-I-D		Alternative I-A		Alternative I-B		Alternative I-C		Alternative I-D	
Vegetation Communities	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I
Conifer Forest	1	<1	1	<1	1	<1	2	<1	<1	<1	<1	<1	<1	<1	1	<1
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/Disturbed	52	<1	50	<1	70	<1	61	<1	13	<1	12	<1	18	<1	15	<1
Dunes	16	<1	1	<1	<1	<1	1	<1	4	<1	<1	<1	<1	<1	<1	<1
Grassland	105	<1	92	<1	187	<1	92	<1	30	<1	25	<1	50	<1	25	<1
Greasewood Flat	21	<1	78	<1	31	<1	41	<1	6	<1	17	<1	8	<1	9	<1
Herbaceous Wetland	23	<1	15	<1	7	<1	29	<1	5	<1	3	<1	2	<1	6	<1
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	2	<1	-	-	-	-	-	-	1	<1	-	-
Open Water	3	<1	2	<1	3	<1	2	<1	1	<1	1	<1	1	<1	1	<1
Pinyon-Juniper	29	<1	30	<1	31	<1	30	<1	8	<1	8	<1	9	<1	8	<1
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,203	<1	1,125	<1	1,663	<1	1,434	<1	309	<1	272	<1	404	<1	328	<1
Saltbush Shrubland	552	<1	624	<1	235	<1	565	<1	135	<1	140	<1	52	<1	127	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	16	<1	17	<1	19	<1	15	<1	4	<1	4	<1	5	<1	3	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Alternative I-B

Key Parameters Summary

In Alternative I-B, the majority of the disturbance would occur in the sagebrush and saltbush shrubland vegetation communities. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 45 acres of pinyon-juniper, and 29 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 78 acres of greasewood flat, 15 acres of herbaceous wetlands, and 17 acres of woody riparian and wetland areas. Of this, 17 acres of greasewood flat, 3 acres of herbaceous wetlands, and 4 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetland and riparian types in Alternative I-B include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative I-B would include riparian woodlands and shrublands in lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative I-C

Key Parameters Summary

In Alternative I-C, the majority of the disturbance would occur in the sagebrush vegetation community. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 46 acres of pinyon-juniper, and 23 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 31 acres of greasewood flat, 7 acres of herbaceous wetlands, and 19 acres of woody riparian and wetland areas. Of this, 8 acres of greasewood flat, 2 acres of herbaceous wetlands, and 5 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative I-C include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands types found along Alternative I-C include riparian woodlands and shrublands in montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative I-D (Agency Preferred)

Key Parameters Summary

The majority of the disturbance for this alternative would occur in the sagebrush vegetation community. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 45 acres of pinyon-juniper, and 24 acres of woody riparian and wetland vegetation communities. Alternative I-D has less impact to agriculture lands and grasslands compared to Alternative I-C. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 41 acres of greasewood flat, 29 acres of herbaceous wetlands, and 15 acres of woody riparian and wetland areas. Of this, 9 acres of greasewood flat, 6 acres of herbaceous wetlands, and 3 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative I-D include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands types found along Alternative I-D include riparian woodlands and shrublands in montane and lower elevation areas.

Along Alternative I-D are the Tuttle Easement micro-siting options 1, 2, and 3. For the Tuttle Easement micro-sites, the vegetation communities located along options 1, 2, and 3 are similar to the vegetation communities located along Alternative I-D. All three micro-siting options would affect more pinyon-juniper from ROW clearing and trampling compared to Alternative I-D. Impacts to vegetation would be similar between the three micro-siting options and the comparable section of Alternative I-D.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Connectors in Region I

The Alternative Connectors in Region I would include minimal increases in surface disturbance acreages for the various vegetation community types crossed, if constructed. Wetlands and riparian areas in the Fivemile Point North and South Alternative Connectors include herbaceous riparian washes, streams, rivers, and floodplains. Wetlands and riparian areas in the Mexican Flats Alternative Connectors include greasewood flats. Wetlands and riparian areas in the Baggs Alternative Connectors include greasewood flats, and riparian woodlands and shrublands in lower elevation areas. **Table 3.5-14** summarizes impacts and advantages associated with the alternative connectors in Region I. Impacts to each vegetative community would comprise less than 1 percent of the total acreage of each vegetative community in the analysis area.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the northern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided. The impacts associated with constructing and operating this system are discussed in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.5-15** summarizes impacts associated with the northern ground electrode system. **Table 3.5-16** summarizes impacts associated with the northern ground electrode transmission line. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route. Impacts to each vegetative community would comprise less than 1 percent of the total acreage of each vegetative community in the analysis area.

Table 3.5-14 Summary of Region I Alternative Connector Impacts for Vegetation

	Fivemile Point North Alternative Connector						Fivemile Point South Alternative Connector						Mexican Flats Alternative Connector						Baggs Alternative Connector					
	ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance		ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance		ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance		ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance	
Vegetation Communities	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**	**Acres**	**% of Region I**
Total	**20**	**<1**	**82**	**<1**	**8**	**<1**	**42**	**<1**	**31**	**<1**	**6**	**<1**	**206**	**<1**	**129**	**<1**	**26**	**<1**	**464**	**<1**	**294**	**<1**	**70**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	<1	<1	-	-	-	-	-	-	-	-	--	--	--	--	--	--	4	<1	3	<1	1	<1
Cliff and Canyon	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1	--	--	8	<1	7	<1	2	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	2	<1	1	<1
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/ Disturbed	4	<1	14	<1	1	<1	<1	<1	<1	<1	--	--	8	<1	5	<1	1	<1	14	<1	8	<1	2	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	26	<1	15	<1	3	<1	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	--	--
Greasewood Flat	1	<1	6	<1	1	<1	2	<1	1	<1	<1	<1	5	<1	4	<1	1	<1	6	<1	4	<1	1	<1
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	2	<1	1	<1	<1	<1	3	<1	2	<1	1	<1
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	14	<1	59	<1	6	<1	40	<1	30	<1	6	<1	21	<1	16	<1	3	<1	382	<1	237	<1	57	<1
Saltbush Shrubland	1	<1	2	<1	<1	<1	-	-	-	-	-	-	143	<1	87	<1	18	<1	45	<1	31	<1	7	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	<1	<1	1	<1	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	1	<1	1	<1	<1	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-15 Summary of Region I Alternative Ground Electrode Siting Area Impact Parameters for Vegetation

	Eight Mile Basin (All Alternatives)				Separation Flat (All Alternatives)				Little Snake West (Alternative I-A)				Little Snake West (Alternatives I-B and I-D)				Little Snake East (Alternatives I-A, I-B, I-D)				Separation Creek (All Alternatives)				Shell Creek (Alternatives I-A and I-D)				Shell Creek (Alternative I-B)			
	Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)	
Vegetation Communities	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I
Total	**86**	**<1**	**18**	**<1**	**128**	**<1**	**39**	**<1**	**121**	**<1**	**37**	**<1**	**93**	**<1**	**21**	**<1**	**108**	**<1**	**29**	**<1**	**138**	**<1**	**48**	**<1**	**223**	**<1**	**89**	**<1**	**189**	**<1**	**71**	**<1**
Agriculture	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Aspen Forest and Woodland	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barren/Sparsely Vegetated	1	<1	<1	<1	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cliff and Canyon	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Conifer Forest	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Deciduous Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Desert Shrub	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Developed/Disturbed	3	<1	1	<1	2	<1	1	<1	1	<1	<1	<1	1	<1	<1	<1	1	<1	<1	<1	3	<1	1	<1	3	<1	1	<1	3	<1	1	<1
Dunes	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	<1	6	<1	12	<1	5	<1
Grassland	2	<1	<1	<1	--	--	--	--	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Greasewood Flat	1	<1	<1	<1	3	<1	1	<1	1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	2	<1	1	<1	1	<1	<1	<1	1	<1	<1	<1
Herbaceous Wetland	2	<1	<1	<1	7	<1	2	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	2	<1	1	<1	2	<1	1	<1
Montane Grassland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Montane Shrubland	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	--	--	--	--	--	--	--	--
Open Water	2	<1	<1	<1	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon-Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Riparian	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sagebrush Shrubland	61	<1	12	<1	9	<1	3	<1	104	<1	31	<1	79	<1	18	<1	106	<1	29	<1	129	<1	45	<1	124	<1	49	<1	105	<1	39	<1
Saltbush Shrubland	13	<1	3	<1	107	<1	32	<1	15	<1	5	<1	11	<1	3	<1	<1	<1	<1	<1	3	<1	1	<1	75	<1	30	<1	63	<1	24	<1
Tundra	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Woody Riparian and Wetlands	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	1	<1	<1	<1	4	<1	2	<1	4	<1	1	<1

Discrepancies in totals due to rounding error.

Table 3.5-16 Summary of Region I Alternative Ground Electrode Overhead Electric Line Impact Parameters for Vegetation (Miles)

Vegetation Communities	Separation Flat (All Alternatives)	Little Snake West (Alternative I-A)	Little Snake West (Alternatives I-B and I-D)	Little Snake East (Alternatives I-A, I-B, I-D)	Eight Mile Basin (All Alternatives)	Shell Creek (Alternatives I-A and I-D)	Shell Creek (Alternative I-B)	Separation Creek (All Alternatives)
Total	**13**	**18**	**14**	**12**	**4**	**32**	**25**	**1**
Agriculture								
Aspen Forest and Woodland								
Barren/Sparsely Vegetated		<1	<1			<1	<1	
Cliff and Canyon	<1					<1	<1	
Conifer Forest								
Deciduous Forest								
Desert Shrub								
Developed/Disturbed	1	<1	<1	<1	1	1	<1	<1
Dunes	<1					1	1	
Grassland	<1	1	1		<1			
Greasewood Flat	<1	<1	<1	<1	<1	<1	<1	
Herbaceous Wetland	<1					<1	<1	
Montane Grassland								
Montane Shrubland								
Open Water				<1				
Pinyon-Juniper								
Riparian								
Sagebrush Shrubland	5	9	7	11	3	14	12	<1
Saltbush Shrubland	7	8	5	<1	<1	15	11	<1
Tundra								
Woody Riparian and Wetlands	<1					1	1	

Discrepancies in totals due to rounding error. Blanks indicate no impact.

Region I Conclusion

In Region I, the alternative resulting in the most acres of vegetation impacted is Alternative I-C. Alternative I-A would impact the least vegetation acreage. Impacts from vegetation clearing are fairly similar between Alternative I-A and the Alternative I-D as both alternatives cross similar vegetation communities with similar acreages. Vegetation clearing would impact less than 1 percent of each vegetation community for each alternative in the Region I analysis area. Noxious weeds impacts would be similar between these two alternatives due to the similarities in vegetation communities crossed, and similar climate conditions between these two alternatives. Revegetation constraints would be similar between Alternatives I-A and I-C, as would the potential for vegetation type conversion from either shrublands to grasslands, or woodlands to shrublands/grasslands.

Impacts to wetland and riparian areas would be similar between Alternative I-A and Alternative I-D, with slightly more impacts to herbaceous wetlands under Alternative I-D. Impacts to wetlands would be the least under Alternative I-C. Less than 1 percent of wetlands would be impacted for each alternative in Region I of the analysis area.

3.5.6.4 Region II

Table 3.5-17 provides a comparison of impacts associated with the alternative routes in Region II.

Alternative II-A

Key Parameters Summary

In Alternative II-A, the majority of disturbance would occur in the sagebrush shrubland vegetation community. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 165 acres of aspen forest and woodland, 68 acres of conifer forest, 29 acres of deciduous forest, 732 acres of pinyon-juniper, and 53 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 152 acres of greasewood flat, 12 acres of herbaceous wetlands, and 38 acres of woody riparian and wetlands. Of this, 36 acres of greasewood flat, 3 acres of herbaceous wetlands, and 12 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetland and riparian types along Alternative II-A include playas and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-A would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Table 3.5-17 Summary of Region II Alternative Route Impacts for Vegetation

	Construction Disturbance												Operation Disturbance											
	Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F		Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F	
Vegetation Communities	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
ROW Clearing/Trampling[1]																								
Total	**5,392**	**<1**	**7,103**	**<1**	**7,487**	**<1**	**5,267**	**<1**	**5,499**	**<1**	**5,393**	**<1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Agriculture	457	<1	168	<1	237	<1	80	<1	288	<1	104	<1	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	165	<1	149	<1	49	<1	270	<1	65	<1	162	<1	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	37	<1	314	<1	339	<1	47	<1	41	<1	48	<1	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	96	<1	89	<1	161	<1	140	<1	100	<1	133	<1	-	-	-	-	-	-	-	-	-	-	-	-
Conifer Forest	68	<1	150	<1	34	<1	124	<1	82	<1	191	<1	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	29	<1	-	-	-	-	-	-	4	<1	4	<1	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	22	<1	37	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/Disturbed	296	<1	365	<1	245	<1	252	<1	341	<1	281	<1	-	-	-	-	-	-	-	-	-	-	-	-
Dunes	2	<1	4	<1	7	<1	2	<1	2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	377	<1	365	<1	473	<1	427	<1	388	<1	418	<1	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	249	<1	817	<1	878	<1	326	<1	283	<1	299	<1	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	17	<1	13	<1	9	<1	18	<1	49	<1	9	<1	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	15	<1	22	<1	1	<1	39	<1	46	<1	51	<1	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	400	<1	269	<1	222	<1	342	<1	448	<1	459	<1	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	5	<1	4	<1	14	<1	2	<1	6	<1	3	<1	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	732	<1	956	<1	1,026	<1	727	<1	894	<1	865	<1	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,936	<1	1,297	<1	1,449	<1	1,741	<1	1,916	<1	1,741	<1	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	461	<1	2,055	<1	2,277	<1	716	<1	514	<1	610	<1	-	-	-	-	-	-	-	-	-	-	-	-
Tundra	-	-	14	<1	-	-	1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	53	<1	36	<1	30	<1	15	<1	34	<1	15	<1	-	-	-	-	-	-	-	-	-	-	-	-
Facilities[2]																								
Total	**3,744**	**<1**	**5,002**	**<1**	**5,064**	**<1**	**4,055**	**<1**	**3,935**	**<1**	**4,276**	**<1**	**1,178**	**<1**	**1,436**	**<1**	**1,308**	**<1**	**1,223**	**<1**	**1,195**	**<1**	**1,392**	**<1**
Agriculture	330	<1	138	<1	177	<1	71	<1	210	<1	82	<1	93	<1	51	<1	49	<1	29	<1	61	<1	32	<1
Aspen Forest and Woodland	105	<1	144	<1	39	<1	240	<1	68	<1	185	<1	35	<1	59	<1	12	<1	85	<1	28	<1	71	<1
Barren/Sparsely Vegetated	24	<1	195	<1	212	<1	42	<1	27	<1	43	<1	6	<1	47	<1	52	<1	13	<1	7	<1	13	<1
Cliff and Canyon	71	<1	74	<1	127	<1	122	<1	83	<1	117	<1	24	<1	21	<1	34	<1	37	<1	25	<1	36	<1
Conifer Forest	52	<1	137	<1	29	<1	119	<1	76	<1	227	<1	20	<1	54	<1	9	<1	43	<1	26	<1	91	<1
Deciduous Forest	17	<1	-	-	-	-	-	-	3	<1	3	<1	5	<1	-	-	-	-	-	-	1	<1	1	<1
Desert Shrub	-	-	14	<1	25	<1	-	-	-	-	-	-	-	-	3	<1	5	<1	-	-	-	-	-	-
Developed/Disturbed	215	<1	294	<1	189	<1	190	<1	235	<1	213	<1	66	<1	84	<1	53	<1	55	<1	69	<1	64	<1
Dunes	1	<1	2	<1	5	<1	1	<1	1	<1	-	-	<1	<1	1	<1	1	<1	<1	<1	<1	<1	-	-
Grassland	252	<1	238	<1	305	<1	292	<1	251	<1	286	<1	63	<1	62	<1	72	<1	75	<1	63	<1	77	<1
Greasewood Flat	152	<1	506	<1	538	<1	215	<1	176	<1	212	<1	36	<1	119	<1	129	<1	53	<1	41	<1	54	<1
Herbaceous Wetland	12	<1	8	<1	7	<1	15	<1	35	<1	6	<1	3	<1	2	<1	2	<1	4	<1	8	<1	1	<1
Montane Grassland	10	<1	22	<1	1	<1	33	<1	32	<1	43	<1	3	<1	9	<1	<1	<1	10	<1	8	<1	13	<1
Montane Shrubland	310	<1	216	<1	171	<1	312	<1	371	<1	392	<1	118	<1	77	<1	50	<1	118	<1	152	<1	159	<1
Open Water	6	<1	5	<1	11	<1	3	<1	6	<1	4	<1	2	<1	2	<1	3	<1	1	<1	1	<1	1	<1
Pinyon-Juniper	558	<1	744	<1	768	<1	606	<1	677	<1	672	<1	199	<1	242	<1	210	<1	199	<1	232	<1	241	<1

Table 3.5-17 Summary of Region II Alternative Route Impacts for Vegetation

	Construction Disturbance												Operation Disturbance											
	Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F		Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F	
Vegetation Communities	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,278	<1	874	<1	918	<1	1,255	<1	1,316	<1	1,313	<1	400	<1	257	<1	232	<1	355	<1	377	<1	407	<1
Saltbush Shrubland	312	<1	1,350	<1	1,517	<1	528	<1	340	<1	463	<1	92	<1	335	<1	388	<1	140	<1	88	<1	124	<1
Tundra	-	-	9	<1	-	-	<1	<1	-	-	-	-	-	-	3	<1	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	38	<1	27	<1	26	<1	12	<1	28	<1	16	<1	12	<1	7	<1	8	<1	4	<1	9	<1	7	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Along Alternative II-A are two sets of micro-siting options, Strawberry IRA option 1, 2, and 3 and Cedar Knoll IRA options 1 and 2. For the Strawberry IRA micro-siting options, the vegetation communities located along options 1, 2, and 3 are similar to the vegetation communities located along Alternative II-A. Impacts to vegetation would be the same for each Strawberry IRA micro-siting option and for Alternative II-A. The Cedar Knoll IRA options 1 and 2 have similar vegetation communities to Alternative II-A. Impacts to vegetation would be the same for each Cedar Knoll option and Alternative II-A.

Alternative II-B

Key Parameters Summary

In Alternative II-B, the majority of the disturbance would occur in the saltbush and sagebrush shrubland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 149 acres of aspen forest and woodland, 150 acres of conifer forest, 956 acres of pinyon-juniper, and 36 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations of FRCC for each vegetation community implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 506 acres of greasewood flat, 8 acres of herbaceous wetlands and 27 acres of woody riparian and wetlands. Of this, 119 acres of greasewood flat, 2 acres of herbaceous wetlands and 7 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-B include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-B would include riparian woodlands and shrublands in both montane and lower elevation areas.

The USFS MIS plant species, Rydberg milkvetch is listed for the USFS Fishlake National Forest, which is crossed by Alternative II-B. Based on the elevation requirements for the species, there is no habitat for the species along this alternative within the USFS Fishlake National Forest.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-C

Key Parameters Summary

In Alternative II-C, the majority of the disturbance would occur in the saltbush and sagebrush shrubland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 237 acres of aspen forest and woodland, 34 acres of conifer forest, 1,026 acres of pinyon-juniper, and 30 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction of facilities would disturb 538 acres of greasewood flat, 7 acres of herbaceous wetlands, and 26 acres of woody riparian and wetlands. Of this, 129 acres of greasewood flat, 2 acres of herbaceous wetlands, and 8 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-C include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-C would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

The USFS MIS plant species, Rydberg milkvetch is listed for the USFS Fishlake National Forest, which is crossed by Alternative II-C. While there are no known occurrences along Alternative II-C in Sevier County, Utah, where the route crosses the USFS Fishlake National Forest, potential habitat would be possible based on substrate, elevation, and vegetation parameters. Direct impacts would include the loss of potential habitat, while indirect impacts could include the spread and establishment of noxious and invasive weed species and increased access in the vicinity of the known populations.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-D

Key Parameters Summary

In Alternative II-D, the majority of the disturbance would occur in the sagebrush shrubland vegetation community type. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 270 acres of aspen forest and woodland, 124 acres of conifer forest, 727 acres of pinyon-juniper, and 15 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 215 acres of greasewood flat, 15 acres of herbaceous wetlands and 12 acres of woody riparian and wetlands. Of this, 53 acres of greasewood flat, 4 acres of herbaceous wetlands, and 4 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along in Alternative II-D include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-D would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-E

Key Parameters Summary

In Alternative II-E, the majority of the disturbance would occur in the sagebrush shrubland and pinyon-juniper vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 65 acres of aspen forest and woodland, 82 acres of conifer forest, 4 acres of deciduous forest, 894 acres of pinyon-juniper, and 34 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 176 acres of greasewood flat, 35 acres of herbaceous wetlands, and 28 acres of woody riparian and wetlands. Of this, 41 acres of greasewood flat, 8 acres of herbaceous wetlands, and 9 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-E include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-E include riparian woodlands and shrublands in both montane and lower elevation areas.

Along Alternative II-E are the micro-siting options, Cedar Knoll IRA options 1 and 2. Cedar Knoll IRA options 1 and 2 have similar vegetation communities. Impacts to vegetation would be the same for each Cedar Knoll option and the comparable section of Alternative II-E.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-F (Agency Preferred)

Key Parameters Summary

The majority of the disturbance for this alternative would occur in the sagebrush shrubland and pinyon-juniper vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 162 acres of aspen forest and woodland, 191 acres of conifer forest, 4 acres of deciduous forest, 865 acres of pinyon-juniper, and 15 acres of woody riparian and wetland vegetation communities. Alternative II-A impacts more acres of agriculture but less acres of forests than Alternative II-F. The vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 212 acres of greasewood flat, 6 acres of herbaceous wetlands and 16 acres of woody riparian and wetlands. Of this, 54 acres of greasewood flat, 1 acre of herbaceous wetlands and 7 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-F include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-F include riparian woodlands and shrublands in both montane and lower elevation areas.

Along Alternative II-F are the micro-siting options, Cedar Knoll IRA options 1 and 2. Cedar Knoll IRA options 1 and 2 have similar vegetation communities. Impacts to vegetation would be the same for each Cedar Knoll option and the comparable section of Alternative II-F.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation would impact similar vegetation community types compared to those of Alternative II-F. The Emma Park Alternative Variation would increase the total area affected by ROW trampling and clearing from 577 to 669 acres. The area of forests impacted would increase slightly in the Emma Park Alternative Variation (310 versus 296 acres), with greater impacts to aspen forest and woodland (211 versus 133 acres) and pinyon-juniper (73 versus 2 acres), but with smaller impacts to conifer forest (26 versus 161 acres). The Emma Park Alternative Variation also would have larger impacts to agriculture, cliff and canyon, montane shrubland, sagebrush shrubland, and herbaceous wetlands compared to Alternative II-F. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Connectors in Region II

Each of the Region II alternative connectors would result in small disturbance acreage increases in the various vegetation community types crossed. Wetlands and riparian areas in the Lynndyl and IPP East Alternative Connectors include herbaceous wetlands. Vegetation clearing would occur in aspen forest and woodlands, conifer forests, pinyon-juniper, and woody riparian and wetlands if some of these alternative connectors were used. **Table 3.5-18** summarizes impacts and advantages associated with the alternative connectors in Region II. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Region II Conclusion

In Region II, Alternative II-F would affect almost the same total acreage as Alternative II-A. Both routes would cross the Uintah Basin and the Wasatch Mountains. Alternative II-F would cross more acreage at higher elevation terrain than Alternative II-A. Alternative II-A would cross more agriculture lands, deciduous forests, and woody riparian and wetlands. Vegetation clearing would impact more forested areas in Alternative II-F, whereas there would be a greater impact to wetlands on Alternative II-A. Impacts to vegetation communities under Alternative II-F would comprise less than 1 percent of the analysis area in Region II.

For all routes, reclamation in the Uintah Basin would be difficult due to soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, specifically halogeton. Additionally, reclamation in the San Rafael Swell area, specifically along Alternatives II-B and II-C, would be difficult due to soil reclamation constraints, and low regional annual precipitation rates. Construction and operation impacts would be similar between Alternative II-F and Alternative II-A due to the similarities in vegetation communities crossed, and similar climate conditions between the two alternatives.

3.5.6.5 Region III

Table 3.5-19 provides a comparison of impacts associated with the alternative routes in Region III.

Alternative III-A (Applicant Proposed)

Key Parameters Summary

In Alternative III-A, the majority of the disturbance would occur in the desert shrub, grassland, sagebrush shrubland, and saltbush shrubland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 276 acres of pinyon-juniper and 12 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Table 3.5-18 Summary of Region II Alternative Connector Impacts for Vegetation (acres)

Vegetation Communities	Lynndyl Alternative Connector						IPP East Alternative Connector						Price Alternative Connector						Castle Dale Alternative Connector						Highway 191 Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
Total	**511**	**<1**	**305**	**<1**	**72**	**<1**	**50**	**<1**	**36**	**<1**	**7**	**<1**	**369**	**<1**	**280**	**<1**	**81**	**<1**	**225**	**<1**	**176**	**<1**	**50**	**<1**	**61**	**<1**	**119**	**<1**	**38**	**<1**
Agriculture	-	-	4	<1	1	<1	-	-	-	-	-	-	-	-	-	-	-	-	17	<1	17	<1	6	<1	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	<1	9	<1	4	<1
Barren/ Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-	2	<1	2	<1	1	<1	2	<1	2	<1	1	<1	-	-	-	-	-	-
Cliff and Canyon	-	-	-	-	-	-	-	-	-	-	-	-	7	<1	8	<1	3	<1	10	<1	8	<1	2	<1	5	<1	10	<1	3	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1	-	-	-	-	-	-	12	<1	22	<1	7	<1
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/ Disturbed	12	<1	8	<1	2	<1	-	-	<1	<1	-	-	22	<1	18	<1	6	<1	32	<1	21	<1	5	<1	2	<1	4	<1	1	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	138	<1	79	<1	18	<1	10	<1	7	<1	1	<1	4	<1	3	<1	1	<1	9	<1	6	<1	1	<1	-	-	-	-	-	-
Greasewood Flat	2	<1	1	<1	<1	<1	13	<1	10	<1	2	<1	12	<1	7	<1	2	<1	8	<1	7	<1	2	<1	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	15	<1	13	<1	3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1
Montane Shrubland	-	-	<1	<1	-	-	-	-	-	-	-	-	6	<1	5	<1	2	<1	-	-	-	-	-	-	10	<1	17	<1	4	<1
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	-	-	-	-	-	-
Pinyon-Juniper	47	<1	34	<1	9	<1	-	-	-	-	-	-	139	<1	106	<1	31	<1	11	<1	9	<1	3	<1	3	<1	6	<1	2	<1
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	295	<1	164	<1	38	<1	-	-	-	-	-	-	133	<1	99	<1	28	<1	16	<1	14	<1	4	<1	26	<1	51	<1	16	<1

Table 3.5-18 Summary of Region II Alternative Connector Impacts for Vegetation (acres)

Vegetation Communities	Lynndyl Alternative Connector						IPP East Alternative Connector						Price Alternative Connector						Castle Dale Alternative Connector						Highway 191 Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
Saltbush Shrubland	2	<1	2	<1	1	<1	26	<1	18	<1	3	<1	44	<1	30	<1	8	<1	117	<1	89	<1	25	<1	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	-	-	-	-	2	<1	1	<1	<1	<1	3	<1	3	<1	1	<1	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-19 Summary of Region III Alternative Route Impacts for Vegetation

	Construction Disturbance						Operation Disturbance					
	Alternative III-A		Alternative III-B		Alternative III-C		Alternative III-A		Alternative III-B		Alternative III-C	
Vegetation Communities	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**
ROW Clearing/Trampling[1]												
Total	**5,852**	**<1**	**6,056**	**<1**	**6,539**	**<1**	**-**	**-**	**-**	**-**	**-**	**-**
Agriculture	-	-	14	<1	4	<1	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	14	<1	15	<1	1	<1	-	-	-	-	-	-
Cliff and Canyon	33	<1	14	<1	9	<1	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	2,013	<1	1,688	<1	1,648	<1	-	-	-	-	-	-
Developed/Disturbed	105	<1	87	<1	83	<1	-	-	-	-	-	-
Dunes	-	-	45	<1	45	<1	-	-	-	-	-	-
Grassland	1,018	<1	1,057	<1	1,108	<1	-	-	-	-	-	-
Greasewood Flat	345	<1	378	<1	463	<1	-	-	-	-	-	-
Herbaceous Wetland	79	<1	92	<1	115	<1	-	-	-	-	-	-
Montane Grassland	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
Montane Shrubland	10	<1	134	<1	-	-	-	-	-	-	-	-
Open Water	2	<1	2	<1	1	<1	-	-	-	-	-	-
Pinyon-Juniper	276	<1	331	<1	337	<1	-	-	-	-	-	-
Riparian	58	<1	79	<1	18	<1	-	-	-	-		-
Sagebrush Shrubland	974	<1	1,083	<1	1,479	<1	-	-	-	-	-	-
Saltbush Shrubland	912	<1	984	<1	1,215	<1	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	12	<1	53	<1	12	<1	-	-	-	-	-	-
Facilities[2]												
Total	**3,641**	**<1**	**3,543**	**<1**	**3,926**	**<1**	**996**	**<1**	**875**	**<1**	**953**	**<1**
Agriculture	2	<1	9	<1	4	<1	1	<1	2	<1	1	<1
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	9	<1	10	<1	2	<1	3	<1	2	1	<1	<1

Table 3.5-19 Summary of Region III Alternative Route Impacts for Vegetation

	Construction Disturbance						Operation Disturbance					
	Alternative III-A		Alternative III-B		Alternative III-C		Alternative III-A		Alternative III-B		Alternative III-C	
Vegetation Communities	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Cliff and Canyon	23	<1	11	<1	15	<1	7	<1	4	<1	5	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	1,267	<1	1,009	<1	1,026	<1	389	<1	263	<1	251	<1
Developed/Disturbed	64	<1	56	<1	54	<1	16	<1	13	<1	13	<1
Dunes	-	-	27	<1	27	<1	-	-	6	<1	6	<1
Grassland	592	<1	613	<1	639	<1	139	<1	142	<1	154	<1
Greasewood Flat	210	<1	229	<1	287	<1	48	<1	51	<1	70	<1
Herbaceous Wetland	46	<1	55	<1	75	<1	10	<1	12	<1	19	<1
Montane Grassland	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Montane Shrubland	15	<1	86	<1	-	-	8	<1	24	<1	-	-
Open Water	2	<1	2	<1	1	<1	<1	<1	<1	<1	<1	<1
Pinyon-Juniper	227	<1	215	<1	207	<1	77	<1	61	<1	53	<1
Riparian	41	<1	50	<1	11	<1	13	<1	11	<1	3	<1
Sagebrush Shrubland	594	<1	617	<1	863	<1	156	<1	144	<1	208	<1
Saltbush Shrubland	539	<1	576	<1	709	<1	126	<1	132	<1	169	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	9	<1	28	<1	7	<1	3	<1	6	<1	2	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 210 acres of greasewood flats, 46 acres of herbaceous wetlands, 41 acres of riparian, and 9 acres of woody riparian and wetlands. Of this, 48 acres of greasewood flats, 10 acres of herbaceous wetlands, 13 acres of riparian, and 3 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along in Alternative III-A include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative III-A would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative III-B (Agency Preferred)

Key Parameters Summary

The majority of the disturbance would occur in the desert shrub, grassland, sagebrush shrubland, and saltbush shrubland vegetation community types. Alternative III-B would cross in the vicinity of the Little Sahara Sand Dunes Recreation Area. Due to the sandy substrate, shifting topography, and winds in the area, reclamation would be difficult and most likely would not be successful. See Section 3.3, Soils, for more detail. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 331 acres of pinyon-juniper and 53 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 229 acres of greasewood flat, 55 acres of herbaceous wetlands, 50 acres of riparian, and 28 acres of woody riparian and wetlands. Of this, 51 acres of greasewood flat, 12 acres of herbaceous wetlands, 11 acres of riparian, and 6 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along in Alternative III-B include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative III-B would include riparian woodlands and shrublands in lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative III-C

Key Parameters Summary

In Alternative III-C, the majority of the disturbance would occur in the desert shrub, grassland, sagebrush shrubland, and saltbush shrubland vegetation community types. Alternative III-C would cross in the vicinity of the Little Sahara Sand Dunes Recreation Area. Due to the sandy substrate, shifting topography, and winds in the area, reclamation would be difficult and most likely would not be successful. See Section 3.3,

Soils, for more detail. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 337 acres of pinyon-juniper and 12 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 287 acres of greasewood flat, 75 acres of herbaceous wetlands, 11 acres of riparian, and 7 acres of woody riparian and wetlands. Of this, 70 acres of greasewood flat, 19 acres of herbaceous wetlands, 3 acres of riparian, and 2 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetland and riparian types along Alternative III-C include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative III-C would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Variations in Region III

Table 3.5-20 provides a comparison of impacts associated with the alternative variations in Region III.

The Ox Valley East Alternative Variation would impact similar vegetation community types compared to those of Alternative III-A; however, there would be additional impacts in the aspen forest and woodland, cliff and canyon, and pinyon-juniper vegetation community types. Wetlands and riparian areas in the Ox Valley East Variation include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

The Ox Valley West Alternative Variation would impact similar vegetation community types compared to those of Alternative III-A; however, there would be additional impacts in the aspen forest and woodland, cliff and canyon, pinyon-juniper, and woody riparian community types, and decreased impacts in the developed/disturbed, montane shrubland, and sagebrush shrubland community types under this variation. Wetlands and riparian areas in the Ox Valley West Variation include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

The Pinto Alternative Variation would impact similar vegetation community types compared to those of Alternative III-A, however there would be additional impacts in the agriculture, desert shrub, pinyon-juniper, saltbush shrub community types, and decreased impacts in the grassland, and sagebrush shrubland community types under this variation. Wetlands and riparian areas in the Ox Valley East Variation include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Connectors in Region III

The Moapa Alternative Connector and Avon Alternative Connector would include minor disturbance acreage increases across the various vegetation community types crossed if constructed. Vegetation clearing would occur in the woody riparian and wetlands community type for the Moapa Alternative Connector. There would be no vegetation clearing for the Avon Connector as there are no vegetation communities identified as likely

Table 3.5-20 Summary of Region III Alternative Variation Impacts for Vegetation (acres)

Vegetation Communities	Ox Valley East Alternative Variation						*Alternative III-A Comparable*						Ox Valley West Alternative Variation						*Alternative III-A Comparable*						Pinto Alternative Variation						*Alternative III-A Comparable*					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Total	**315**	**<1**	**276**	**<1**	**100**	**<1**	***285***	***<1***	***252***	***<1***	***95***	***<1***	**333**	**<1**	**268**	**<1**	**100**	**<1**	***285***	***<1***	***252***	***<1***	***95***	***<1***	**572**	**<1**	**449**	**<1**	**111**	**<1**	***469***	***<1***	***381***	***<1***	***125***	***<1***
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1	-	-	-	-	-	-
Aspen Forest and Woodland	3	<1	2	<1	1	<1	-	-	-	-	-	-	3	<1	2	<1	1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/ Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	4	<1	2	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*	4	<1	2	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*	-	-	<1	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	<1	<1	<1	<1	-	-	*1*	*<1*	*1*	*<1*	*1*	*<1*	<1	<1	<1	<1	-	-	*1*	*<1*	*1*	*<1*	*1*	*<1*	17	<1	11	<1	2	<1	-	-	*<1*	*<1*	*<1*	*<1*
Developed/ Disturbed	4	<1	3	<1	1	<1	*5*	*<1*	*4*	*<1*	*1*	*<1*	3	<1	2	<1	1	<1	*5*	*<1*	*4*	*<1*	*1*	*<1*	16	<1	11	<1	2	<1	*14*	*<1*	*9*	*<1*	*2*	*<1*
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	<1	<1	2	<1	1	<1	*1*	*<1*	*2*	*<1*	*1*	*<1*	<1	<1	2	<1	1	<1	*1*	*<1*	*2*	*<1*	*1*	*<1*	3	<1	5	<1	2	<1	*1*	*<1*	*2*	*<1*	*1*	*<1*
Greasewood Flat	-	-	-	-	-	-	-	-	*<1*	*<1*	-	-	-	-	-	-	-	-	-	-	*<1*	*<1*	-	-	1	<1	1	<1	<1	<1	-	-	*<1*	*<1*	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	-	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	-	-	<1	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	39	<1	36	<1	16	<1	*8*	*<1*	*14*	*<1*	*7*	*<1*	37	<1	35	<1	15	<1	*8*	*<1*	*14*	*<1*	*7*	*<1*	13	<1	11	<1	3	<1	*8*	*<1*	*14*	*<1*	*7*	*<1*
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	-	-	*<1*	*<1*	-	-
Pinyon-Juniper	155	<1	134	<1	46	<1	*126*	*<1*	*113*	*<1*	*43*	*<1*	169	<1	129	<1	45	<1	*126*	*<1*	*113*	*<1*	*43*	*<1*	304	<1	250	<1	64	<1	*176*	*<1*	*156*	*<1*	*54*	*<1*
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3.5-20 Summary of Region III Alternative Variation Impacts for Vegetation (acres)

Vegetation Communities	Ox Valley East Alternative Variation						*Alternative III-A Comparable*						Ox Valley West Alternative Variation						*Alternative III-A Comparable*						Pinto Alternative Variation						*Alternative III-A Comparable*					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Sagebrush Shrubland	107	<1	93	<1	32	<1	*139*	*<1*	*115*	*<1*	*41*	*<1*	112	<1	91	<1	34	<1	*139*	*<1*	*115*	*<1*	*41*	*<1*	215	<1	156	<1	36	<1	*267*	*<1*	*196*	*<1*	*59*	*<1*
Saltbush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	3	<1	5	<1	3	<1	*3*	*<1*	*3*	*<1*	*1*	*<1*	4	<1	5	<1	3	<1	*3*	*<1*	*3*	*<1*	*1*	*<1*	2	<1	3	<1	1	<1	*3*	*<1*	*3*	*<1*	*1*	*<1*

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

having vegetation over 6 feet in height along the 250-foot-wide transmission line ROW. Wetlands and riparian areas in the Moapa Alternative Connector include riparian woodland and shrublands. The Avon connector includes riparian communities, such as warm desert washes. **Table 3.5-21** summarizes impacts and advantages associated with the alternative connectors in Region III. Impacts to each vegetative community would comprise less than 1 percent of the total of each vegetative community in the analysis area.

Alternative Ground Electrode Systems in Region III

The southern ground electrode system would be necessary within 100 miles of the southern terminal as discussed in Chapter 2. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The impacts associated with constructing and operating this system are discussed in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.5-22** summarizes impacts associated with the southern ground electrode system. **Table 3.5-23** summarizes impacts associated with the southern ground electrode transmission line. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Region III Conclusion

In Region III, the alternative with the most acres impacted is Alternative III-C. Alternative III-A would impact the least vegetation acreage. Impacts from vegetation clearing are fairly similar between Alternative III-A and Alternative III-B as both alternatives cross similar vegetation communities with similar acreage of disturbance. Impacts to vegetation communities under Alternative III-B would be less than 1 percent of the analysis area in Region III. Alternative III-B and Alternative III-C would cross in the vicinity of the Little Sahara Sand Dunes Recreation Area, which would be difficult to reclaim. For more information, see Section 3.3, Soils.

Noxious weeds impacts would be similar between the two alternatives due to the similarities in vegetation communities crossed and similar climate conditions between the two alternatives. Revegetation constraints would be similar between the two alternatives, as would the potential for vegetation type conversion from either shrublands to grasslands, or woodlands to shrublands/grasslands. The agency preferred alternative crosses more acres of herbaceous wetlands, specifically in Lincoln County, Nevada, while the Applicant Proposed route crosses slightly more acres of woody riparian and wetlands habitat.

3.5.6.6 Region IV

Table 3.5-24 provides a comparison of impacts associated with the alternative routes in Region IV.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Key Parameters Summary

The majority of the disturbance for this alternative would occur in the desert shrub and developed/disturbed vegetation community types, with minor impacts occurring in the barren/sparsely vegetated, cliff and canyon, riparian, saltbush shrubland, and woody riparian and wetland community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in less than 1 acre of the woody riparian and wetland community type. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Table 3.5-21 Summary of Region III Alternative Connector Impacts for Vegetation

	Moapa Alternative Connector						Avon Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
Vegetation Communities	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**	**Acres**	**% of Region III**
Total	**264**	**<1**	**168**	**<1**	**34**	**<1**	**164**	**<1**	**104**	**<1**	**21**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	-	-	-	-	-	-	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	178	<1	116	<1	24	<1	-	-	-	-	-	-
Developed/Disturbed	2	<1	1	<1	<1	<1	2	<1	2	<1	<1	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	8	<1	5	<1	1	<1
Greasewood Flat	-	-	-	-	-	-	1	<1	1	<1	<1	<1
Herbaceous Wetland	-	-	-	-	-	-	-	-	<1	<1	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	84	<1	51	<1	10	<1	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	21	<1	14	<1	3	<1
Saltbush Shrubland	-	-	-	-	-	-	132	<1	81	<1	16	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	1	<1	<1	<1	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-22 Summary of Region III Alternative Ground Electrode Siting Area Impact Parameters to Vegetation

Vegetation Communities	Halfway Wash – Virgin River (Alternative III-A)				Halfway Wash – Virgin River (Alternative III-B)				Halfway Wash East (Alternative III-A)				Halfway Wash East (Alternative III-B)				Meadow Valley 2 (Alternative III-C)				Mormon Mesa-Carp Elgin Rd (Alternative III-A)				Mormon Mesa-Carp Elgin Rd (Alternative III-B)			
	Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Total	**84**	**<1**	**16**	**<1**	**93**	**<1**	**20**	**<1**	**104**	**<1**	**26**	**<1**	**102**	**<1**	**25**	**<1**	**174**	**<1**	**66**	**<1**	**91**	**<1**	**19**	**<1**	**103**	**<1**	**26**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/ Sparsely Vegetated	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	1	<1	<1	<1	-	-	-	-	-	-	-	-
Cliff and Canyon	1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	5	<1	2	<1	-	-	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	65	<1	12	<1	71	<1	15	<1	76	<1	19	<1	75	<1	18	<1	144	<1	54	<1	57	<1	12	<1	64	<1	16	<1
Developed/ Disturbed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	18	<1	3	<1	20	<1	4	<1	27	<1	7	<1	27	<1	7	<1	16	<1	6	<1	35	<1	7	<1	49	<1	10	<1

Table 3.5-22 Summary of Region III Alternative Ground Electrode Siting Area Impact Parameters to Vegetation

Vegetation Communities	Halfway Wash – Virgin River (Alternative III-A)				Halfway Wash – Virgin River (Alternative III-B)				Halfway Wash East (Alternative III-A)				Halfway Wash East (Alternative III-B)				Meadow Valley 2 (Alternative III-C)				Mormon Mesa-Carp Elgin Rd (Alternative III-A)				Mormon Mesa-Carp Elgin Rd (Alternative III-B)			
	Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	8	<1	3	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-23 Summary of Region III Alternative Ground Electrode Transmission Line Impact Parameters to Vegetation (Miles)

Vegetation Communities	Halfway Wash – Virgin River (Alternative III-A)	Halfway Wash – Virgin River (Alternative III-B)	Halfway Wash East (Alternative III-A)	Halfway Wash East (Alternative III-B)	Meadow Valley 2 (Alternative III-C)	Mormon Mesa – Carp Elgin Rd (Alternative III-A)	Mormon Mesa-Carp Elgin Rd (Alternative III-B)
Total	**4**	**6**	**8**	**9**	**22**	**5**	**16**
Agriculture	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	<1	-	-
Cliff and Canyon	<1	<1	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-
Desert Shrub	3	5	7	8	21	4	10
Developed/Disturbed	-	<1	-	<1	-	-	<1
Dunes	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	<1	-	-
Montane Grassland	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-
Riparian	<1	1	1	1	<1	1	5
Sagebrush Shrubland	-	-	-	-	-	-	-
Saltbush Shrubland	-	-	-	-	1	-	-
Tundra	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	<1	-	-

Discrepancies in totals due to rounding error.

Construction of facilities would disturb 5 acres of riparian, and less than 1 acre of woody riparian and wetlands, while operation impacts would occur in 1 acre of riparian.

Specific riparian woodlands and wetlands found along Alternative IV-A would include desert washes and riparian woodlands and shrublands.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Table 3.5-24 Summary of Region IV Alternative Route Impacts for Vegetation

	Construction Disturbance						Operation Disturbance					
	Alternative IV-A		Alternative IV-B		Alternative IV-C		Alternative IV-A		Alternative IV-B		Alternative IV-C	
	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV
ROW Clearing/Trampling[1]												
Total	**738**	**<1**	**818**	**<1**	**893**	**<1**	**-**	**-**	**-**	**-**	**-**	**-**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	35	<1	38	<1	38	<1	-	-	-	-	-	-
Cliff and Canyon	9	<1	12	<1	12	<1	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	454	<1	459	<1	465	<1	-	-	-	-	-	-
Developed/Disturbed	225	<1	295	<1	355	<1	-	-	-	-	-	-
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	1	<1	1	<1	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	8	<1	1	<1	1	<1	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	6	<1	5	<1	14	<1	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	<1	<1	7	<1	7	<1	-	-	-	-	-	-
Facilities[2]												
Total	**566**	**<1**	**573**	**<1**	**663**	**<1**	**148**	**<1**	**180**	**<1**	**182**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	25	<1	32	<1	32	<1	5	<1	8	<1	8	<1

Table 3.5-24 Summary of Region IV Alternative Route Impacts for Vegetation

	Construction Disturbance						Operation Disturbance					
	Alternative IV-A		Alternative IV-B		Alternative IV-C		Alternative IV-A		Alternative IV-B		Alternative IV-C	
	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV
Cliff and Canyon	13	<1	11	<1	11	<1	4	<1	3	<1	3	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	341	<1	322	<1	328	<1	87	<1	106	<1	106	<1
Developed/Disturbed	179	<1	194	<1	272	<1	51	<1	55	<1	56	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	1	<1	1	<1	<1	<1	<1	<1	<1	<1
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	5	<1	5	<1	-	-	4	<1	4	<1
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	5	<1	1	<1	1	<1	1	<1	<1	<1	<1	<1
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	3	<1	2	<1	8	<1	1	<1	1	<1	2	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	<1	<1	5	<1	5	<1	-	-	2	<1	2	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile-wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Alternative IV-B

Key Parameters Summary

In Alternative IV-B, the majority of the disturbance would occur in the desert shrub and developed/disturbed community types, with minor impacts occurring in the barren/sparsely vegetated, cliff and canyon, herbaceous wetland, riparian, saltbush shrubland, and woody riparian and wetland community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 7 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 1 acre of herbaceous wetlands, 1 acre of riparian, and 5 acres of woody riparian and wetlands. Of this, less than 1 acre of herbaceous wetlands, less than 1 acre of riparian, and 2 acres of woody riparian and wetlands would be impacted by operations. Specific herbaceous wetlands and riparian types along Alternative IV-B include emergent marshes, while specific riparian woodlands and wetlands include desert washes and riparian woodlands and shrublands.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative IV-C

Key Parameters Summary

In Alternative IV-C, the majority of the disturbance would occur in desert shrub and developed/disturbed vegetation community types, with minor impacts occurring in the barren/sparsely vegetated, cliff and canyon, herbaceous wetland, riparian, saltbush shrubland, and woody riparian and wetland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 7 acres of the woody riparian and wetland vegetation community. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 1 acre of herbaceous wetlands, 1 acre of riparian, and 5 acres of woody riparian and wetlands. Of this, less than one acre each of herbaceous wetlands and riparian and 2 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative IV-C include emergent marshes, while specific riparian woodlands and wetlands include desert washes, and riparian woodlands and shrublands.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Variations in Region IV

The Marketplace Alternative Variation would impact the same vegetation communities as compared to Alternative IV-B. Implementation and effects of mitigation measures would be the same as described for Alternative I-A. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Table 3.5-25 provides a comparison of impacts associated with the alternative variations in Region IV.

Table 3.5-25 Summary of Region IV Alternative Variation Impacts for Vegetation

	Marketplace Alternative Variation (Alternative IV-B)						***Alternative IV-B Comparable***					
	ROW Clearing[1]		**Construction Disturbance**		**Operation Disturbance**		**ROW Clearing[1]**		**Construction Disturbance**		**Operation Disturbance**	
Vegetation Communities	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**
Total	**155**	**<1**	**108**	**<1**	**21**	**<1**	***154***	***<1***	***82***	***<1***	***19***	***<1***
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	-	-	1	<1	<1	<1	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	66	<1	50	<1	10	<1	*1*	*<1*	*<1*	*<1*	*<1*	*<1*
Developed/Disturbed	88	<1	58	<1	11	<1	*153*	*<1*	*82*	*<1*	*18*	*<1*
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Alternative Connectors in Region IV

All the Alternative Connectors in Region IV would include minor surface disturbance increases across the various vegetation community types, with the greatest disturbances associated with barren/sparsely vegetated and desert shrub community types. There would be no vegetation clearing of woody vegetation over 6 feet in height along the construction ROW for the Region IV alternative connectors. The River Mountains Alternative Connector includes a small area of riparian vegetation communities. **Table 3.5-26** summarizes impacts and advantages associated with the alternative connectors in Region IV. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Region IV Conclusion

In Region IV, the alternative resulting in the most acres of vegetation impacted is Alternative IV-C, while Alternative IV-A would impact the least vegetation acreage. Impacts to vegetation communities on the various alternatives would comprise less than 1 percent of the analysis area in Region IV.

Noxious weeds impacts would be similar between these two alternatives due to the similarities in vegetation communities crossed, and similar climate conditions between the two alternatives. Revegetation constraints would be similar between the two alternatives, as would the potential for vegetation type conversion from either shrublands to grasslands, or woodlands to shrublands/grasslands. The Agency Preferred Alternative crosses herbaceous wetlands and woody riparian and wetlands habitat, while according to the SWReGAP data, the Applicant Proposed route does not cross herbaceous wetlands, or woody riparian and wetlands.

3.5.6.7 Residual Impacts

Residual impacts would include the loss of vegetation related to the permanent placement of facilities, and access roads for the life of the project, the invasion and spread of noxious weeds and invasive species into previously undisturbed areas, and fragmentation of native habitats.

Vegetation recovery to similar cover and species composition after implementation of a reclamation program is expected to occur at varying rates. Overall community recovery is anticipated to take 2 to 3 years to reestablish an early seral vegetation community. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, successful reestablishment of early seral native vegetation may take a longer timeframe. It is estimated that overall, herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations. Woody-dominated plant communities would require at least 10 to 25 years for shrubs to recolonize the area while re-establishment of mature woodlands would require at least 30 to 50 or more years. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term, and may not be successful (10 to 100 years depending on the community structure).

Depending on the composition and topography of existing woodlands, recovery could take up to 80 to 100 years to achieve mature trees of similar stature to pre-construction conditions. The success of woodland re-establishment could be impacted by co-located disturbances and adverse environmental conditions including wildfire, drought, climate change, insects, and disease (Folke et al. 2004; Loehman et al. 2011). Wildfire in combination with adverse environmental conditions could result in woodlands converting to shrubland communities over time.

Implementation of the Project design features, the agency and WWEC BMPs, and the proposed additional mitigation measures would minimize residual impacts to vegetation, wetlands, and riparian areas from noxious weeds and invasive species, erosion, and fire. Residual impacts due to the loss of sagebrush habitat are discussed in Section 3.8, Special Status Wildlife Species. Noxious weed and invasive species may persist over the long term regardless of the implementation of control programs. Some plant

communities may not return to pre-construction conditions due to alteration of soil communities, noxious weed invasion, and loss of biological soil crusts. Fragmentation and the conversion of vegetation communities may occur over the long term, depending on the success of reclamation and associated disturbance from maintenance activities over the life of the Project.

Residual impacts, especially noxious weed invasion, may impact the reclamation success as defined by each BLM FO and USFS forest. Residual impacts, depending on their type, and quantity, may exceed the significance threshold of impacts for individual BLM FOs or USFS forests, depending on the requirements of the management documents.

3.5.6.8 Impacts to Vegetation from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. The analysis area would exist under current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). Therefore, impacts to vegetation resources associated with the development of the proposed Project would not occur.

3.5.6.9 Irreversible and Irretrievable Commitment of Resources

For all alternatives, Project-related impacts that may affect productivity include the disturbance of shrub-dominated and woody vegetation cover types that would require 10 to 100 years to recover, and the potential that populations of weedy annual species (e.g., halogeton, cheatgrass) may become established in localized areas for extended periods of time. The decrease in vegetation cover types either through direct impacts (i.e., removal of vegetation) or indirect impacts (i.e., the spread of noxious and invasive species) could impact ecological function, livestock and wildlife grazing, and recreation activities in and around the areas to be disturbed.

For areas with low reclamation potential (i.e., the slow revegetation rates and low revegetation success), the proposed project could result in impacts to vegetation communities that would extend beyond construction, operation, and decommissioning activities, affecting long-term habitat value and human uses of these areas.

3.5.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

For areas successfully reclaimed (as defined by each land management agency after construction), no irretrievable commitments are anticipated. For plant communities, including woody dominated vegetation communities, and areas of low-reclamation potential, the alteration of these communities may persist during the life of the project, resulting in an irretrievable loss of these resources. These impacts would be reversible by the successful reclamation of these communities to pre-construction conditions.

Irreversible commitments would result from construction and operation impacts that result in the permanent conversion of plant communities. This may occur in areas where reclamation is not successful, or fragmentation and noxious weed and invasive species permanently alter native habitats. If successful reclamation is not achieved, disturbed areas would no longer support native vegetation.

Table 3.5-26 Summary of Region IV Alternative Connector Impacts for Vegetation

	Sunrise Mountain Alternative Connector						Lake Las Vegas Alternative Connector						Three Kids Mine Alternative Connector						River Mountains Alternative Connector						Railroad Pass Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
Vegetation Communities	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV
Total	**50**	**<1**	**37**	**<1**	**8**	**<1**	**86**	**<1**	**54**	**<1**	**19**	**<1**	**106**	**<1**	**93**	**<1**	**33**	**<1**	**132**	**<1**	**142**	**<1**	**57**	**<1**	**48**	**<1**	**58**	**<1**	**14**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	28	<1	20	<1	4	<1	3	<1	1	<1	<1	<1	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
Cliff and Canyon	2	<1	1	<1	<1	<1	-	-	-	-	-	-	1	<1	1	<1	<1	<1	4	<1	6	<1	3	<1	-	-	<1	<1	<1	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	19	<1	16	<1	4	<1	68	<1	42	<1	15	<1	86	<1	77	<1	28	<1	127	<1	131	<1	50	<1	2	<1	7	<1	3	<1
Developed/Disturbed	-	-	-	-	-	-	15	<1	10	<1	4	<1	19	<1	15	<1	5	<1	-	-	5	<1	3	<1	46	<1	50	<1	11	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

3.6 Special Status Plant Species

3.6.1 Regulatory Background

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the BLM and USFS. In addition, there are state protected plant lists for Nevada (Nevada Administrative Code 501.100-503.104) that include many of the BLM and USFS sensitive species as well as ESA-listed species.

In accordance with the ESA, as amended, the lead agencies (BLM and Western) in coordination with the USFWS must ensure that any action that they authorize, fund, or carry out would not adversely affect a federally listed threatened or endangered species, and cannot destroy or adversely modify designated critical habitats for federally listed plant species. In addition, as stated in the BLM's Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it also is BLM policy "to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA provisions are no longer needed for these species, and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Regulations that directly influence special status species management decisions within the analysis area are primarily implemented by the BLM and USFS. Special status species regulations relevant to the Project include:

- ESA of 1973;
- BLM Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125);
- USFS Manual (FSM) 2670;
- Nevada Administrative Code (CE); and
- Nevada Revised Statutes (NRS).

The analysis for special status species assumes the BLM and USFS will continue to manage special status species' habitats in coordination with the USFWS.

3.6.2 Data Sources

Information regarding special status plant species and their habitat within the analysis area was obtained from a review of existing published sources, BLM RMPs, USFS LRMPs, BLM, USFS, USFWS, and NPS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information obtained through correspondence with agency botanists and ecologists was incorporated into this section as appropriate.

3.6.3 Analysis Area

The analysis area for special status plant species encompasses the total area within the HUC 10 watershed boundaries (as defined in Section 3.4.3) crossed by the 2-mile transmission line corridors for all alternatives and the locations of other Project components including terminals and ground electrodes. Special status plant species and their habitats that may be present within the 2-mile transmission line corridor (based on available literature and data reviewed for the Project) are carried forward for analysis.

3.6.4 Baseline Description

In total, 304 special status plant species were evaluated for potential occurrence within the 2-mile transmission line corridor. These species, their associated habitats, and potential for occurrence within

and around the 2-mile transmission line corridor are summarized in **Appendix G**, **Table G-1**. Occurrence potential was evaluated for each species based on its habitat requirements and known distribution. Based on these evaluations, 162 special status plant species have been eliminated from further consideration in the EIS. The rationale for eliminating these species from detail analysis is provided in **Appendix G**, **Table G-1**. In total, 140 special status plant species were carried forward for detailed analysis. Some species are included in multiple protection status categories. A summary of the listing status, habitat, and general distribution for the federally listed plant species that were carried forward in detailed analysis is provided below. Special status plant species occurrences are summarized by Project region in Section 3.6.5, Regional Summary of Special Status Plant Species.

3.6.4.1 Federally Listed, Candidate, and Proposed Plant Species

Shivwitz Milkvetch (*Astragalus ampullaroides*) – Federally Endangered

The Shivwitz milkvetch, a perennial forb, was listed as endangered pursuant to the ESA on September 28, 2001, due to its rarity and declining population trends as well as the threats of urban development, off-road vehicle use, grazing, displacement by invasive plants, and mineral development (USFWS ECOS 2012). The species is found within desert shrub and saltbush communities, specifically warm desert shrub, creosote bush (*Larrea tridentata*), and juniper (*Juniperus* spp.) communities on purple-hued patches of soft clay typically associated with the Petrified Forest member of the Chinle Formation. Occupied sites are small, with populations found between 3,018 and 4,363 feet amsl in sparsely vegetated habitat with an average 12 percent vegetative cover. The species is typically found in dense patches, flowering between May and June. The species is constrained by the isolation of appropriate soil substrate and limited mechanisms for seed dispersal, with fluctuating population numbers that may be dependent on rainfall (UNPS 2003-2006; USFWS 2006).

The Shivwitz milkvetch is an endemic species of the Mojave Desert and is known to occur in the vicinity of St. George in Washington County, southwestern Utah. Within the analysis area, Shivwitz milkvetch is only known from two locations in Washington County, Utah. The remaining known occurrences for this species are east of the analysis area. The species has been documented approximately 4 miles southeast of the 2-mile transmission line corridor for Alternative III-A in Washington County, Utah. On December 27, 2006, the USFWS designated 2,181 acres of critical habitat for the species in Washington County, Utah; the closest critical habitat parcel is located adjacent to Alternative III-A (USFWS ECOS 2012).

Deseret Milkvetch (*Astragalus desereticus*) – Federally Threatened

The Deseret milkvetch, a perennial herb, was listed as threatened under the ESA on October 20, 1999 (USFWS ECOS 2012). The species is found in barren/sparsely vegetated, montane shrub, desert shrub, and pinyon–juniper communities, specifically open to sparse juniper-sagebrush (*Artemisia* sp.) communities on open, steep, naturally disturbed south and west (rarely north) facing slopes. Populations are found between 5,400 and 5,700 feet amsl, flowering between May and June.

The Deseret milkvetch is a narrow endemic occurring only on the sandy-gravelly hillsides of the Moroni Formation near the community of Birdseye in Utah County, Utah (UDWR 2012). A 5-year review of the species was completed in 2011 (USFWS). The review determined that many of the previously identified threats were not as significant as had been anticipated or had failed to develop. Based on the 5-year review UFWS determined that the species should be proposed for delisting due to the absence of threats to the species and its habitat and because the species' known range and population size is greater than previously thought (USFWS 2011).

The species has been documented within the 2-mile transmission line corridor for Alternatives II-A, II-E, and II-F in Utah County, Utah. The species is not found outside the analysis area. Critical habitat has not been designated for this species.

Jones Cycladenia (*Cycladenia humilis* var. *jonesii*) – Federally Threatened

The Jones cycladenia, a perennial herb, was listed as threatened under the ESA on May 5, 1986 (USFWS ECOS 2012). The species is found in desert shrub, and pinyon–juniper communities, specifically, buckwheat (*Eriogonum* sp.)/Mormon tea (*Ephedra* sp.), cool desert shrub, and juniper communities comprised of gypiferous saline soils. Populations are found between 4,400 and 6,000 feet amsl, flowering between mid May and June (UNPS 2003-2006).

The Jones cycladenia is an endemic of the Chinle, Cutler, and Summerville formations within Emery, Garfield, Grand, and Kane counties, Utah (UNPS 2003-2006). Jones cycladenia is found in the southern portions of the analysis area in Emery and Grand counties, Utah. The majority of the known occurrences for the species are found outside of the analysis area. The species is known to occur in central Utah, documented approximately 8.5 miles southwest of the 2-mile transmission line corridor for Alternatives II-B and II-C in Emery County, Utah. Critical habitat has not been designated for this species (USFWS ECOS 2012).

Las Vegas Buckwheat (*Eriogonum corymbosum* var. *nilesii*) – Federal Candidate

The Las Vegas buckwheat, a perennial subshrub, was designated a candidate for federal listing under the ESA on December 6, 2007 (USFWS ECOS 2012). Threats to the species include the loss of individuals and/or habitat, inadequacy of existing regulatory mechanisms, and noxious and invasive weed species. The species is found in barren/sparsely vegetated areas, specifically, on and near gypsum soils, often forming low mounds or outcrops in washes and drainages, or in areas of generally low relief. The species is often associated with California bearpoppy (*Arctomecon californica*) and other gypsum-tolerant species, surrounded by burrobush (*Ambrosia dumosa*), desert princesplume (*Stanleya pinnata*), fourwing saltbush (*Atriplex canescens*), Torrey's jointfir (*Ephedra torreyana*), creosote bush (*Larrea tridentata*), catclaw acacia (*Acacia greggii*), Mojave seablite (*Suaeda torreyana*), and Fremont's dalea (*Psorothamnus fremontii*). Populations are found between 1,900 to 3,839 feet amsl and flower between August and November (NNHP 2001; Styles 2010).

The Las Vegas buckwheat, a species of the Mojave Desert, is known from the Las Vegas and Muddy Mountains region of Clark County, Nevada; Lincoln County, Nevada, near Toquop Wash; and Washington County, Utah (NNHP 2001; Styles 2010). Within the analysis area, the species is found in Clark County and southern Lincoln County. The bulk of the known occurrences are found west of the analysis area. The species has been documented within the 2-mile transmission line corridor for Alternatives III-A, III-B, and III-C in Lincoln and Clark counties, Nevada, and adjacent to multiple 2-mile transmission line corridors in Clark County, Nevada. Since this species is listed as a federal candidate, critical habitat has not been designated for this species (USFWS ECOS 2012).

Barneby Ridgecress (*Lepidium barnebyanum*) – Federally Endangered

The Barneby ridgecress, a perennial herb, was listed as threatened under the ESA on September 28, 1990 (USFWS ECOS 2012). Threats to the species include oil and gas activities, ORVs, and trampling from livestock grazing. The species is found within pinyon-juniper communities on poorly developed soils derived from the marly shale outcrops in a zone of interbedding geologic stratas from the Uinta and Green River formations. Populations are found between 6,200 and 6,500 feet amsl and flowering occurs in early May (USFWS 1993).

Within the analysis area, the Barneby ridgecress is known from only three ridges near Indian Canyon on the Uintah and Ouray Reservations of the Ute Indian Tribe within the Uinta Basin, Duchesne County, northeastern Utah (USFWS 1993). The species is not found outside the analysis area. This species has been documented adjacent to the 2-mile transmission line corridor for Alternatives II-A and II-E in Duchesne County, Utah. Critical habitat has not been designated for this species.

San Rafael Cactus (*Pediocactus despainii*) – Federally Endangered

The San Rafael cactus was listed as endangered pursuant to the ESA on September 16, 1987 (52 FR 34914) due to its rarity and declining population trends as a result of over-collection, trampling, and destruction of habitat for access to oil and gas reserves. Threats to San Rafael cactus include small population size, habitat loss, ORV use, trampling by humans and livestock, mineral and energy development, and illegal collection. The species grows in pinyon-juniper communities on fine textured, mildly alkaline soils rich in calcium derived from limestone substrates of the Carmel Formation and the Sinbad member of the Moenkopi formation. The species is most commonly found on benches, hill tops, and gentle slopes with a southern exposure. It grows in open woodlands of scattered Utah juniper (*Juniper osteosperma*) and pinyon pine (*Pinus edulis*) with an understory of shrubs and grasses (USFWS 1995). The habitat of the San Rafael cactus is underlain by bentonite clay, uranium ore deposits, gypsum, petroleum, and other minerals. Populations are found at approximately 6,000 feet amsl, flowering between late April and early May.

The San Rafael cactus is restricted entirely to the San Rafael Swell in Emery and Wayne counties of central Utah. Approximately half of the known occurrences are found within the analysis area in Emery County, Utah; the rest of the known occurrences are found south of the analysis area predominantly in Emery County, Utah. The species has been documented within and adjacent to the 2-mile transmission line corridor for Alternative II-C in Emery County, Utah. Critical habitat has not been designated for this species.

Siler Pincushion Cactus (*Pediocactus sileri*) – Federally Threatened

The Siler pincushion cactus was listed as threatened pursuant to the ESA on December 27, 1993 (58 FR 68476) due to habitat destruction from mining activities, off-road vehicle use, over-collection from both private and commercial interests, and trampling by grazing livestock (58 FR 68476; NatureServe 2012; Phillips et al. 1979; USFWS 1986a). The effects of these identified threats are intensified by the species' restricted habitat and its small, scattered, disjunct populations (44 FR 61786; NatureServe 2012; USFWS 1986a). The species grows in desert shrub, montane shrub, pinyon-juniper, and conifer forests in gypsiferous and calcareous clay soils derived from members of the Moenkopi Formation, and sometimes on members of the Chinle and Kaibab Formations. It is commonly associated with shadscale (*Atriplex confertifolia*), fourwing saltbush, big sagebrush (*Artemisia tridentata*), flat sagebrush (*Artemisia bigelovii*), rabbitbrush (*Chrysothamnus* spp.), and Mormon tea (*Ephedra* spp.). At higher elevations, common associates are Colorado pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and cliffrose (*Purshia mexicana*), while lower elevation habitat is dominated by creosotebush (*Larrea tridentata*) and cheesebush (*Hymenoclea salsola*) (USFWS 1986a). This species typically grows in soils which are high in soluble salts, usually white or gray in color, or occasionally red if derived from some red members of the Moenkopi Formation (58 FR 68476; Phillips et al. 1979). Populations are found between 3,000 to 5,200 feet amsl, flowering between March and April/May.

The Siler pincushion cactus is found in the extreme southern parts of Washington and Kane counties in southwestern Utah. All known occurrences for Siler pincushion cactus are found outside the analysis area. The species has been documented approximately 23 miles southeast of the 2-mile transmission line corridor for Alternative III-A in Washington County, Utah. Critical habitat has not been designated for this species.

Winkler Cactus (*Pediocactus winkleri*) – Federally Threatened

The Winkler cactus was listed as threatened pursuant to the ESA on August 20, 1998 (63 FR 44587) due to habitat destruction from ORV use, over-collection from both private and commercial interests, and, to a lesser extent, from mineral exploration, disease, and trampling by grazing livestock (USFWS 2007). The species is found in barren/sparsely vegetated, and saltbush shrub communities. The species inhabits benches, hilltops, and gentle southern exposed slopes on barren, open sites at lower elevations, growing in fine-textured, mildly alkaline soils with high clay content derived from the Dakota

Formation and Brushy Basin member of the Morrison Formation (BLM 2008; Tilley et al. 2011a; USFWS 1995). The species is associated with the saltbrush vegetation community of the Canyonlands section of the Colorado Plateau Floristic Division, characterized by drought-tolerant shrubs and grasses with ephemeral forbs including saltbush, rabbitbrush (*Chrysothamnus pulchellus*), vetches (*Astragalus* spp.), catseye (*Cryptantha* spp.), and Nuttall's horsebrush (*Tetradymia nuttallii*) (USFWS 1995). Populations are found between 4,800 to 5,200 feet amsl, flowering between late March and mid-May.

The Winkler cactus is endemic to central Utah in Emery and Wayne counties. Winkler cactus is found in only two locations within the analysis area in Emery County, Utah. The majority of the species' known locations are found south of the analysis area. The species has been documented approximately 1.5 miles east and 6 miles northwest of the 2-mile transmission line corridor for Alternative II-C in Emery County, Utah. Critical habitat has not been designated for this species.

Graham's Penstemon (*Penstemon grahamii*) – Federally Proposed

The Graham's penstemon has been proposed for listing as a threatened species under the ESA pursuant to candidate notice of review documents dated September 12, 2006 (71 FR 53756 53835). Threats to the species include degradation of the species' habitat by mineral and energy development, ORV use, overgrazing, overutilization for horticultural use, small population sizes, and limited distribution. The species inhabits desert shrub, saltbush shrub, and pinyon-juniper communities, specifically, sparsely vegetated shadscale, buckwheat, horsebrush, ryegrass, and pinyon-juniper communities on shale ledges and talus of the Green River Formation. Populations are found between 4,600 to 7,600 feet amsl, flowering between late May and mid-June (NatureServe 2012; UNPS 2003-2006).

The Graham's penstemon is restricted to the Uinta Basin in Uintah, Carbon, and Duchesne counties, Utah, and adjacent Rio Blanco County, Colorado. Within the analysis area, Graham's penstemon is restricted to the Uinta Basin, with the majority of known occurrences in the analysis area located in southern Uintah County. The species has been documented within Alternatives II-A, II-B, II-C, II-D, and II-E within Uintah and Duchesne counties, Utah; and adjacent to the 2-mile transmission line corridor for Alternatives II-B and II-C in Rio Blanco County, Colorado. Proposed critical habitat has been designated for this species, which affords protection under the ESA (USFWS ECOS 2012).

White River Beardtongue (*Penstemon scariosus* var. *albifluvis*) – Federal Candidate

The White River beardtongue was designated as a candidate for federal listing under the ESA on November 28, 1983 (48 FR 53640). Due to its association with oil shale barrens, the species is vulnerable to habitat destruction as a consequence of energy exploration, production and other activities within its limited habitat (48 FR 53640). Habitat loss and fragmentation has the potential to result in reduced seed and pollen dispersal leading to a reduced beardtongue population (48 FR 53640). The White River beardtongue is found in barren/sparsely vegetated, pinyon-juniper, and desert shrub communities. It is specifically endemic to the oil shale barrens found in semi-barren openings in pinyon-juniper-desert shrub or desert shrub communities on substrates composed of fine-textured soils and shale fragments weathered from the Green River Formation of the Uinta Basin of northeastern Utah and adjacent Colorado (BLM 2008). The species is frequently found on white or red soil at an elevation of 5,000 to 6,680 feet amsl, flowering between late May and June. Associated vegetation includes shadscale, rabbitbrush, ricegrass (*Achnatherum hymenoides*), Salina ryegrass (*Elymus salinus*), sagebrush, and Barneby's thistle (*Cirsium barnebyi*) (Tilley et al. 2011b; USFWS 2012b).

According to available data, the White River beardtongue is located in eastern Uintah County, Utah, and western Rio Blanco County, Colorado, near the White River in the vicinity of Evacuation Creek and Weaver Ridge. Within the analysis area, White River beardtongue is found along the border between Colorado and Utah within its range. The species has been documented approximately 6 miles west of the 2-mile transmission line corridor for Alternatives II-B and II-C in Rio Blanco County, Colorado; and approximately 8 miles southeast of the 2-mile transmission line corridor for Alternative II-D in Uintah

County, Utah. Since this species is only a candidate for federal listing, critical habitat has not been designated (USFWS ECOS 2012).

Clay Phacelia (*Phacelia argillacea*) – Federally Endangered

The clay phacelia, a winter annual, was listed as endangered pursuant to the ESA on June 28, 1978 (43 FR 44810), due to climactic changes, edaphic factors, and its drastically small population size. Additional threats include rarity and declining population trends as a result of over-collection, trampling, livestock and wildlife grazing, noxious and invasive weed species, railroad maintenance, and destruction of habitat for access to oil and gas reserves. The species is found in pinyon-juniper, montane shrub, and barren/sparsely vegetated areas. It is specifically found on steep slopes (up to 70 percent) in sparsely populated juniper-pinyon and mountain brush communities (Welsh 1987) associated with skunkbush sumac (*Rush trilobata*) and serviceberry (*Amelranchier alnifolia*) located on shaley clay colluviums of the Green River Formation (Atwood 1975; USFWS 1982). The species occurs at elevations between 6,000 and 7,000 feet amsl, flowering between late May and early June.

Within the analysis area, clay phacelia has a limited range, with its only known occurrences being in Spanish Fork Canyon in the vicinity of Tucker and down-canyon near Mill Fork in Utah County, central Utah (UDWR 2010-2012). The species has been documented within, and immediately adjacent to, the 2-mile transmission line corridor for Alternative II-E in Utah County, Utah. Critical habitat has not been designated for this species.

Clay Reed-mustard (*Schoenocrambe argillacea*) – Federally Threatened

The clay reed-mustard, a perennial herb, was listed as threatened pursuant to the ESA on January 14, 1992, due to habitat disturbance from oil and gas, and oil shale developments (57 FR 1398 1403). Additional threats to the species includes its small population size, habitat destruction from mineral and energy exploration and development, recreational activities, and/or building stone excavation. The species occurs in mixed desert shrub communities of shadscale, Indian ricegrass, and pygmy sagebrush (*Artemisia pygmaea*) located on generally north-facing slopes composed of clay soils rich with gypsum overlain with sandstone talus on shale substrates at the contact zone between the lower Uinta and upper Green River formations (UDWR 2010-2012; UNPS 2003-2006). The species occurs at elevations between 4,800 and 5,600 feet amsl, flowering between April and May.

Within the analysis area, the clay reed-mustard has limited range. The species is endemic to the Bookcliffs in Uintah County, Utah; known populations are present from the west side of the Green River to the east side of Willow Creek (UDWR 2010-2012; UNPS 2003-2012). The species is known to occur in northeastern Utah, documented within, and immediately adjacent to, the 2-mile transmission line corridor for Alternatives II-D and II-F in Utah County, Utah. Critical habitat has not been designated for this species.

Shrubby Reed-mustard (*Schoenocrambe suffrutescens*) – Federally Endangered

The shrubby reed-mustard, a perennial herb, was listed as endangered pursuant to the ESA on October 6, 1987 (52 FR 37416 37420) due to various habitat disturbances including building stone removal, localized historic overgrazing, and oil and gas development (USFWS ECOS 2012). The species occurs in shadscale, pygmy sagebrush, mountain mahogany (*Cercocarpus montanus*), juniper, and other mixed desert shrub communities on calcareous shale substrates of the Evacuation Creek member of the Green River Shale Formation (BLM 2008; UNPS 2003-2006). The species occurs at elevations between 5,400 and 6,000 feet amsl, flowering between late May and June/July.

The shrubby reed-mustard is endemic to the Hill Creek and Willow Creek drainages, and to the Badland Cliffs within Duchesne and Uintah counties, Utah (BLM 2008; UNPS 2003-2006), within the analysis area. No known occurrences occur outside of the analysis area. The species has been documented approximately 1 mile south of the 2-mile transmission line corridor for Alternative II-D in Duchesne

County, Utah, and approximately 5 miles south of the 2-mile transmission line corridor for Alternatives II-D and II-F in Uintah County, Utah. Critical habitat has not been designated for this species (USFWS ECOS 2012).

Colorado Hookless Cactus (*Sclerocactus glaucus*) – Federally Threatened

The Colorado hookless cactus was listed as threatened pursuant to the ESA on October 11, 1979, based primarily on threats of over-collection and habitat destruction (44 FR 58868). Additional threats to Colorado hookless cactus include loss of habitat, mineral and energy development, utility construction, water development Projects, illegal collection, recreational ORV use, and grazing. The species grows in salt desert shrub communities, big sagebrush, and pinyon-juniper woodlands on alluvial benches, soils that are coarse, gravelly river alluvium usually consisting of Mancos shale with volcanic cobbles and pebbles of the surface (USFWS 2012a). The soil is weathered from the Uinta and Green River formations. The species is more abundant on south-facing slopes with up to a 30 percent grade, with associated species such as shadscale, galleta (*Hilaria jamesii*), black sagebrush (*Artemisia nova*), and Indian ricegrass (USFWS 2010a, 1990). Populations are found between 4,500 to 6,000 feet amsl, flowering between April and May.

The Colorado hookless cactus is known in Mesa, Delta, Garfield, and Montrose counties, Colorado. The species occurs in two locations of the upper Colorado and Gunnison River valleys of western Colorado; one on the alluvial river terraces of the Gunnison River near Delta to southern Mesa County and the other on the alluvial river terraces of the Colorado River and in the Plateau and Roan Creek drainages near Debeque, Colorado (USFWS 2010a, 1990). The species has been documented within, and adjacent to, the 2-mile transmission line corridor for Alternatives II-B and II-C in Mesa and Garfield counties, Colorado. Within the analysis area, there are no additional Colorado hookless cacti known occurrences. The majority of known occurrences of Colorado hookless cactus are located outside of the analysis area. Critical habitat has not been designated for this species.

Uinta Basin Hookless Cactus (*Sclerocactus wetlandicus*) – Federally Threatened

The Uinta Basin hookless cactus (a member of the *Sclerocactus glaucus* complex due to taxonomic differentiation) was listed as threatened pursuant to the ESA on October 11, 1979 based primarily on threats of mineral and energy development, water development, and collection (44 FR 58868). The species grows in salt desert shrub communities and pinyon-juniper woodlands on river benches, valley slopes, and rolling hills on Quaternary and Tertiary alluvial soils that are fine textured, dry, and overlain with cobble and pebble (BLM 2008). The soil is weathered from the Duchesne River, Uinta, and Green River formations. The species is more abundant on south facing slopes with up to a 30 percent grade, with associated species such as shadscale, galleta, black sagebrush, and Indian ricegrass (USFWS 1990). Populations are found between 4,500 to 6,600 feet amsl, flowering between April to late May.

Uinta Basin hookless cactus is found extensively on the Duchesne River, Green River, and Mancos formations in Carbon, Duchesne, and Uintah counties, Utah. The Uinta Basin hookless cactus (as part of the *S. glaucus* complex) is known to occur in Uintah, Duchesne, and Carbon counties, Utah. The species occurs on the alluvial river terraces near the confluence of the Green, White, and Duchesne rivers, south along the Green River to the vicinity of Sand Wash and the mouth of the Pariette Draw, the Badland Cliffs, and the clay badlands of the Pariette Draw drainage south of Myton, Utah. Within Uintah and Duchesne Counties, core conservation areas for the species have been identified by USFWS. These core conservation areas contain the dense known concentrations of cacti (BLM 2012a). There are two levels of core conservation areas (1, 2) based on pollinator travel distance, and habitat connectivity between populations and individuals. A trans-located population of cactus also falls within the boundaries of one of the core conservation areas. A potentially genetically isolated population of cactus is found near Bonanza, Utah. In the analysis area, the species is located in west and central Uintah County, Utah. The species has been documented within, and adjacent to, Alternatives II-D and II-F in Uintah and Duchesne counties, Utah, and immediately adjacent to the 2-mile transmission line

corridor for Alternative II-A in Duchesne County, Utah. Critical habitat has not been designated for this species.

Wright Fishhook Cactus (*Sclerocactus wrightiae*) – Federally Endangered

The Wright fishhook cactus was listed as endangered pursuant to the ESA on October 11, 1979 (44 FR 58866) due to species collection by professional and amateur cactus growers, resource extraction within occupied and suitable habitat, cactus borer beetle predation, cattle trampling, and ORV crushing. The species grows in salt desert shrub and pinyon-juniper communities, typically in semi-barren sites within desert scrub or open woodland (USFWS 1985). Associated species include pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), valley saltbush (*Atriplex cuneata*), shadscale, saltbush, and galleta (USFWS 1985). The species is found in areas with well-developed gypsiferous layers and in areas with no gypsum, and has been documented on Mancos shale, Emery, Entrada, and Dakota sandstone, Morrison, Summerville, Curtis, and Moenkopi formations, Carmel limestone, and alluvium (70 FR 44544) with soil substrate ranging from clays to sandy silts to fine sands. Populations are found between 4,260 and 5,900 feet amsl, flowering between April and May (NatureServe 2012).

The Wright fishhook cactus is endemic to Emery, Sevier, and Wayne counties in central Utah. Distribution generally follows a low elevation trough around the southern end of the San Rafael Swell uplift. Wright fishhook cactus is found in only two locations within the analysis area in Emery County, Utah. The species has been documented approximately 3.5 miles southeast of the 2-mile transmission line corridor for Alternative II-C in Emery County, and approximately 4 miles south of the 2-mile transmission line corridor for Alternative II-C in Sevier County, Utah. Critical habitat has not been designated for this species.

Ute Ladies'-tresses Orchid (*Spiranthes diluvialis*) – Federally Threatened

The Ute ladies'-tresses orchid was listed as threatened pursuant to the ESA on January 17, 1992 (57 FR 2048), due to adverse impacts such as grazing, and loss or fragmentation of habitat as a result of noxious weed species invasion, and shifts in the species-dependant hydrologic regime. Additional threats to Ute ladies'-tresses orchid include habitat loss and modification, over-collection, noxious and invasive species, herbicide drift, recreation activities, mowing, livestock grazing, hydrologic modifications, herbivory, loss of pollinators, drought, and loss of mycorrhizal symbionts. The species is aquatic or wetland-dependent, and typically occupies moist to very wet, somewhat alkaline or calcareous native meadows near streams, springs, seeps, lake shores, or abandoned stream meanders that still retain ample groundwater (Fertig 2000; USFWS 2010b). The orchid appears to require moisture in the rooting zone, typically provided by a high groundwater table, through the growing season and into late summer or early autumn. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system. Elevations range from 4,200 to 7,000 feet amsl over the entire range of the species, but in each state the species is found at more specific elevation ranges. The species typically flowers from July to August, but can vary from late June to late September depending on the state/region (Fertig 2000; USFWS 2010b).

The Ute ladies'-tresses orchid is known to occur in central and northeastern Utah, northwestern Colorado, and eastern Nevada (USFWS 2010b). Habitat for the Ute ladies'-tresses orchid is also found in southwestern Wyoming (USFWS 2010b). Within the analysis area, the species occurs in wet areas and riparian areas in the northern portion of the analysis area in Duchesne and Uintah counties, Utah. The species is also found outside of the analysis area. The species has been documented within Alternatives II-A and II-E in Utah, Uintah, Duchesne, and Wasatch counties, Utah; and also adjacent to the 2-mile transmission line corridor for Alternatives II-A, II-D, and II-E in Daggett, Duchesne, Wasatch, Uintah, and Utah counties, Utah. Critical habitat has not been designated for this species.

Last Chance Townsendia (*Townsendia aprica*) – Federally Threatened

The Last Chance townsendia was listed as threatened pursuant to the ESA on August 21, 1985 (50 FR 33734) due to mineral and energy development, road building, and livestock trampling. The species generally occurs in galleta and salt desert shrub, and pinyon-juniper communities of the Mancos shale formation (NatureServe 2012). Commonly associated species include galleta, blue grama (*Bouteloua gracilis*), black sagebrush (*Artemisia nova*), shadscale, and yellow rabbitbrush (*Chrysothamnus viscidiflorus*). Surface geology of suitable habitat is highly mixed, containing a wide variety of soils of unusual soil chemistries. The species is mostly found in shale lens soils with very fine silt texture with very high alkalinities, occurring in small, isolated pockets. In effect, such pockets form islands of suitable habitat within otherwise unsuitable geologic substrates. Populations are found between 6,100 to 8,000 feet amsl. The species typically flowers between April and May.

The Last Chance townsendia is endemic to Emery, Sevier, and Wayne counties in central Utah. The majority of the species' populations occur in an 8 km by 48 km band from interstate 70 at the western edge of the San Rafael Swell in southwestern Emery County, west to Fremont Junction in extreme southeastern Sevier County, south to the vicinity of Hartnet Draw in north-central Wayne County. Within the analysis area, Last Chance townsendia is found in eastern Sevier County, and southwestern Emery County. The majority of the populations are found outside the analysis area. Additional small, isolated populations occur to the east and south of the main population group; one near the southern margin and one in the center of the San Rafael Swell and one in the central portion of Capitol Reef National Park. The species has been documented adjacent to the 2-mile transmission line corridor for Alternative II-C in Emery and Sevier counties, Utah. Critical habitat has not been designated for this species.

BLM Sensitive, Forest Sensitive, and Nevada State Listed Species

In addition to federally listed and candidate species, a total of 132 BLM sensitive, USFS sensitive, NPS sensitive, or Nevada state-protected species potentially occur within the 2-mile transmission corridor. This total also includes Nevada cacti and yucca species protected under NRS 527.060.120, which prohibits the destruction, cutting, mutilating, or removal of cactus (*Cactaceae* ssp.) and yucca (Yucca ssp.) without the written permission of the landowner and/or Nevada State Forester Firewarden (NRS 527). Descriptions of occurrence and habitat used by these plant species are provided in **Appendix G**, **Table G-1**. The occurrence of these plants, by region, is presented below.

3.6.5 Regional Summary of Special Status Plant Species

A summary of the number of special status plant species by Project regions is provided in **Table 3.6-1**.

Table 3.6-1 Special Status Plant Species Summary by Project Region

Total within the Analysis Area (All Regions)	Region I	Region II	Region III	Region IV
140	24	84	50	20

Note: Numerous special status plant species are listed within multiple agencies and several species are analyzed in multiple regions.

3.6.5.1 Region I

Region I extends from the Terminal Siting Area east of Rawlins, Wyoming, southwestward through northwestern Colorado and northeastern Utah. Dominant vegetation community types consist mainly of shrublands, specifically sagebrush shrublands and saltbush shrublands. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region I are presented in **Table 3.6-2**.

Table 3.6-2 Special Status Plant Species Potentially Occurring in Region I

Common Name	Scientific Name	Status[1]
Meadow pussytoes	*Antennaria arcuata*	BLM-WY
Cushion milkvetch	*Astragalus aretoides*	BLM-CO
Debris milkvetch	*Astragalus detritalis*	BLM-CO
Meadow milkvetch	*Astragalus diversifolius*	BLM-WY
Duchesne milkvetch	*Astragalus duchesnensis*	BLM-CO
Starvling milkvetch	*Astragalus jejunus* var. *jejunus (Astragalus jejunus)*	BLM-CO
Nelson's milkvetch	*Astragalus nelsonianus*	BLM-CO
Trelease's milkvetch	*Astragalus racemosus* var. *treleasei*	BLM-WY
Ownbey's thistle	*Cirsium ownbeyi*	BLM-WY
Cedar Rim thistle	*Cirsium pulcherrimum* var. *aridum (Cirsium aridum)*	BLM-WY
Tufted cryptantha	*Cryptantha caespitosa*	BLM-CO
Rollins cryptantha	*Cryptantha rollinii*	BLM-CO
Uinta Basin springparsley	*Cymopterus duchesnesis*	BLM-CO
Wyoming tansymustard	*Descurainia torulosa*	BLM-WY
Single-stemmed wild buckwheat	*Eriogonum acaule*	BLM-CO
Ephedra buckwheat	*Eriogonum ephredoides*	BLM-CO
Woodside buckwheat	*Eriogonum tumulosum*	BLM-CO
Nuttall sandwort	*Minuartia nuttallii*	BLM-CO
Matted fiddleleaf	*Nama densum* var. *parviflorum*	BLM-CO
Gibbens penstemon (Gibbens beardtongue)	*Penstemon gibbensii*	BLM-WY, BLM-CO, BLM-UT
Beaver Rim phlox	*Phlox pungens*	BLM-WY
Tufted twinpod	*Physaria condensata*	BLM-WY
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE
Strigose easter daisy	*Townsendia strigosa*	BLM-CO

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; USFS = Forest Sensitive.

3.6.5.2 Region II

Region II extends from northeastern Utah and northwestern Colorado to the IPP in western Utah. Vegetation communities within Region II are diverse, with the dominant vegetation community types consisting of sagebrush shrubland, saltbush shrubland, and pinyon-juniper. Other common vegetation communities include woody riparian and wetlands, grassland, montane shrublands, and agriculture. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region II are presented in **Table 3.6-3**.

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Mussentuchit gilia	*Aliciella tenuis (Gilia tenuis)*	BLM-UT

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Jones' blue star	*Amsonia jonesii*	BLM-CO
Link Trail columbine	*Aquilegia flavescens* var. *rubicunda*	USFS-Manti-La Sal NF
Utah columbine	*Aquilegia scopulorum* var. *goodrichii*	BLM-UT
Unknown	*Arabis goodrichii*	BLM-UT
Cushion milkvetch	*Astragalus aretoides*	BLM-CO
Bicknell milkvetch	*Astragalus consobrinus*	USFS-Fishlake NF
Debeque milkvetch	*Astragalus debequaeus*	BLM-CO
Deseret milkvetch	*Astragalus desereticus*	FT (UT)
Horseshoe milkvetch	*Astragalus desperatus* var. *neeseae (Astragalus equisolensis*)	BLM-UT
Debris milkvetch	*Astragalus detritalis*	BLM-CO
Duchesne milkvetch	*Astragalus duchesnensis*	BLM-CO
Hamilton milkvetch	*Astragalus hamiltonii*	FC(UT), BLM-UT
Starvling milkvetch	*Astragalus jejunus* var. *jejunus (Astragalus jejunus)*	BLM-CO
Loa milkvetch	*Astragalus loanus*	BLM-UT
Ferron milkvetch	*Astragalus musiniensis*	BLM-CO
Naturita milkvetch	*Astragalus naturitensis*	BLM-CO
San Rafael milkvetch	*Astragalus rafaelensis*	BLM-CO
Cisco milkvetch	*Astragalus sabulosus* var. *sabulosus*	BLM-UT
Giant fourwing saltbush	*Atriplex canescens* var. *gigantea*	BLM-UT
Dainty moonwort	*Botrychium crenulatum*	USFS-Ashley NF, USFS-Uinta-Wasatch-Cache NF, BLM-NV
Slender moonwort	*Botrychium lineare*	USFS-Ashley NF, USFS-Uinta-Wasatch-Cache NF
Barneby's catseye	*Cryptantha barnebyi*	BLM-UT
Tufted cryptantha	*Cryptantha caespitosa*	BLM-CO
Creutzfeldt-flower	*Cryptantha creutzfeldtii*	USFS-Manti-La Sal NF, BLM-UT
Graham's catseye	*Cryptantha grahamii*	BLM-UT
Rollins cryptantha	*Cryptantha rollinii*	BLM-CO
Jones cycladenia	*Cycladenia humilis* var. *jonesii (Cycladenia jonesii)*	FT (UT)
Uinta Basin springparsley	*Cymopterus duchesnesis*	BLM-CO
Nevada willowherb	*Epilobium nevadense*	USFS-Fishlake NF, BLM-UT, BLM-NV
Carrington daisy	*Erigeron carringtonae*	USFS-Manti-La Sal NF
Maguire daisy	*Erigeron maguirei*	USFS-Fishlake NF, BLM-UT
Untermann daisy	*Erigeron untermanii*	USFS-Ashley NF, BLM-UT
Single-stemmed wild buckwheat	*Eriogonum acaule*	BLM-CO
Elsinore buckwheat	*Eriogonum batemanii* var. *ostlundii*	USFS-Fishlake NF

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Unknown	*Eriogonum brevicaule* var. *mitophyllum*	BLM-UT
Grand buckwheat	*Eriogonum contortum*	BLM-CO
Ephedra buckwheat	*Eriogonum ephredoides*	BLM-CO
Ibex buckwheat	*Eriogonum nummulare* var. *ammophilum*	BLM-UT
Woodside buckwheat	*Eriogonum tumulosum*	BLM-CO
Utah spurge	*Euphorbia nephradenia*	BLM-UT
Tufted green gentian	*Frasera paniculata*	BLM-CO
Narrowstem gilia	*Gilia stenothysra*	BLM-CO
Canyon sweetvetch	*Hedysarum occidentale* var. *canone*	USFS-Manti-La Sal NF
Wasatch jamesia	*Jamesia americana* var. *macrocalyx*	USFS-Uinta-Wasatch-Cache NF
Barneby ridgecress	*Lepidium barnebyanum*	FE (UT)
Dolores rushpink	*Lygodesmia grandiflora* var. *doloresensis*	BLM-UT
Entrada rushpink	*Lygodesmia grandiflora* var. *entrada*	BLM-UT
Pioche blazingstar	*Mentzelia argillicola*	BLM-NV, BLM-UT
Goodrich blazingstar (Goodrich stickleaf)	*Mentzelia goodrichii*	USFS-Ashley NF, BLM-UT
Horse Canyon stickleaf	*Mentzelia multicaulis* var. *librina*	BLM-UT
Shultz stickleaf	*Mentzelia shultziorum*	BLM-UT
Nuttall sandwort	*Minuartia nuttallii*	BLM-CO
Matted fiddleleaf	*Nama densum* var. *parviflorum*	BLM-CO
Trotter oreoxis	*Oreoxis trotteri*	BLM-UT
Ligulate feverfew	*Parthenium ligulatum*	BLM-CO
San Rafael cactus (Despain pincushion cactus)	*Pediocactus despainii*	FE (UT)
Winkler cactus	*Pediocactus winkleri*	FT (UT)
Neese narrowleaf penstemon	*Penstemon angustifolius* var. *dulcis*	BLM-UT
Goodrich penstemon	*Penstemon goodrichii*	BLM-UT
Graham's penstemon	*Penstemon grahamii*	FP, BLM-CO, BLM-UT
White River beardtongue (White River penstemon)	*Penstemon scariosus (Penstemon scariosus* var. *albifluvis)*	FC (CO, UT), BLM-CO, BLM-UT
Ward beardtongue	*Penstemon wardii*	BLM-UT, USFS-Fishlake NF
Clay phacelia	*Phacelia argillacea*	FE (UT)
Argyle Canyon phacelia	*Phacelia argylensis*	BLM-UT
Utah phacelia	*Phacelia utahensis*	BLM-UT
Jones indigo-bush	*Psorothamnus polydenius* var. *jonesii (Psorothamnus nummularious)*	BLM-UT

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Arizona willow	*Salix arizonica*	USFS-Dixie NF, USFS-Fishlake NF, USFS-Manti-La Sal NF
Clay reed-mustard	*Schoenocrambe argillacea*	FT (UT)
Shrubby reed-mustard	*Schoenocrambe suffrutescens*	FE (UT)
Colorado hookless cactus	*Sclerocactus glaucus*	FT (CO)
Uinta Basin hookless cactus	*Sclerocactus wetlandicus*	FT (UT)
Wright fishhook cactus	*Sclerocactus wrightiae*	FE (UT)
Maguire campion	*Silene petersonii*	USFS-Dixie NF, USFS-Fishlake NF, USFS-Manti-La Sal NF
Psoralea globemallow	*Sphaeralcea psoraloides*	BLM-UT
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE
Thompson talinum	*Talinum thompsonii*	BLM-UT
Cathedral Bluff meadow-rue	*Thalictrum heliophilum*	BLM-CO
Duchesne greenthread (Caespitose greenthread)	*Thelesperma caespitosum (Thelesperma caespitosa)*	USFS-Ashley NF, BLM-UT, BLM-WY
Last Chance townsendia	*Townsendia aprica*	FT (UT)
Sigurd townsendia (Sevier townsendia)	*Townsendia jonesii* var. *lutea*	BLM-UT, USFS-Fishlake NF
Strigose easter daisy	*Townsendia strigosa*	BLM-CO
Strigose townsendia	*Townsendia strigosa* var. *prolixa*	BLM-UT
Sterile yucca	*Yucca sterilis (Yucca harrimaniae* var. *sterilis*)	BLM-UT

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; USFS = Forest Sensitive.

3.6.5.3 Region III

Region III extends from the IPP in western Utah to north Las Vegas, Nevada. In Region III, desert shrub communities start shifting into the dominant vegetation community. Other common vegetation communities include pinyon-juniper, sagebrush shrubland, saltbush shrubland, grassland, and woody riparian and wetlands. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region III are presented in **Table 3.6-4**.

Table 3.6-4 Special Status Plant Species Potentially Occurring in Region III

Common Name	Scientific Name	Status[1]
Sticky ringstem	*Anulocaulis leiosolenus* var. *leiosolenus*	NPS-Lake Mead NRA, BLM-NV
Unknown	*Arabis goodrichii*	BLM-UT
Las Vegas bearpoppy	*Arctomecon californica*	NPS-Lake Mead NRA, NV State CE, BLM-NV
White bearpoppy	*Arctomecon merriamii*	BLM-NV
Eastwood milkweed	*Asclepias eastwoodiana*	BLM-NV

Table 3.6-4 Special Status Plant Species Potentially Occurring in Region III

Common Name	Scientific Name	Status[1]
Sheep Mountain milkvetch	*Astragalus amphioxys* var. *musimonum*	BLM-NV
Shivwitz milkvetch	*Astragalus ampullarioides*	FE (UT)
Torrey milkvetch	*Astragalus calycosus* var. *monophyllidius*	BLM-NV
Veyo milkvetch	*Astragalus ensiformis* var. *gracilior*	BLM-NV
Needle Mountains milkvetch	*Astragalus eurylobus*	BLM-NV
Black woollypod	*Astragalus funereus*	BLM-NV
Threecorner milkvetch	*Astragalus geyeri* var. *triquetrus*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Gilman milkvetch	*Astragalus gilmanii*	BLM-NV
Straw milkvetch	*Astragalus lentiginosus* var. *stramineus*	BLM-NV
Halfring milkvetch	*Astragalus mohavensis* var. *hemygyrus*	BLM-NV
Mokiak milkvetch	*Astragalus mokiacensis*	NPS-Lake Mead NRA, BLM-NV
Pink egg milkvetch (Long-calyx eggvetch)	*Astragalus oophorus* var. *lonchocalyx*	BLM-UT, BLM-NV
Giant fourwing saltbush	*Atriplex canescens* var. *gigantea*	BLM-UT
Alkali mariposa lily	*Calochortus striatus*	BLM-NV
Baird camissonia	*Camissonia bairdii*	BLM-UT
Gould camissonia	*Camissonia gouldii*	BLM-UT
White River catseye	*Cryptantha welshii*	BLM-NV
Sanicle biscuitroot	*Cymopterus ripleyi* var. *saniculoides*	BLM-NV
Gold Butte moss	*Didymodon nevadensis*	BLM-NV
Silverleaf sunray	*Enceliopsis argophylla*	NPS-Lake Mead NRA, BLM-NV
Antelope Canyon goldenbush	*Ericameria cervina*	BLM-NV
Las Vegas buckwheat	*Eriogonum corymbosum var. nilesii*	FC (NV), BLM-NV, NV State CE#
Ibex buckwheat	*Eriogonum nummulare* var. *ammophilum*	BLM-UT
Wirestem buckwheat	*Eriogonum pharnaceoides* var. *cervinum*	BLM-UT
Sticky buckwheat	*Eriogonum viscidulum*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Bullfrog Hills sweetpea	*Lathyrus hitchcockianus*	BLM-NV
Polished blazingstar	*Mentzelia polita*	BLM-NV
Sand cholla	*Opuntia pulcella (Grusonia pulchella)*	NV State CY
Siler pincushion cactus	*Pediocactus sileri*	FT (UT)
Beaver Dam breadroot	*Pediomelum castoreum*	NPS-Lake Mead NRA, BLM-NV
White-margined beardtongue	*Penstemon albomarginatus*	BLM-NV
Neese narrowleaf penstemon	*Penstemon angustifolius* var. *dulcis*	BLM-UT
Yellow twotone beardtongue	*Penstemon bicolor* ssp. *bicolor*	BLM-NV
Rosy twotone beardtongue	*Penstemon bicolor* ssp. *roseus*	NPS-Lake Mead NRA, BLM-NV
Tunnel Springs beardtongue	*Penstemon concinnus*	BLM-NV
Franklin penstemon	*Penstemon franklinii*	BLM-UT

Table 3.6-4 Special Status Plant Species Potentially Occurring in Region III

Common Name	Scientific Name	Status[1]
Pinyon penstemon	*Penstemon pinorum*	USFS-Dixie NF, BLM-UT
Parry petalonyx	*Petalonyx parryii*	BLM-UT
Parish phacelia	*Phacelia parishii*	BLM-NV
Pygmy poreleaf	*Porophyllum pygmaeum*	BLM-NV
Blaine pincushion	*Sclerocactus blainei*	BLM-NV
Schlesser pincushion	*Sclerocactus schlesseri*	BLM-NV
St. George blue-eyed grass	*Sisyrinchium radicatum*	BLM-NV
Jones' globemallow	*Sphaeralcea caespitosa* var. *caespitosa*	BLM-UT
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; NPS = NPS Sensitive; USFS = Forest Sensitive; NV State CE = NV State Critically Endangered; NV State CE = NV State Recommended for Listing a Critically Endangered; NV State CY = NV State Protected as a Cacti, Yucca, or Christmas Tree.

3.6.5.4 Region IV

Region IV extends from north Las Vegas, Nevada to Marketplace. There is less diversity of vegetation communities in Region IV, with the dominant vegetation community type being desert shrub. The remaining eight vegetation communities in Region IV all occupy less than 1 percent of the analysis area. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region IV are presented in **Table 3.6-5**.

Table 3.6-5 Special Status Plant Species Potentially Occurring in Region IV

Common Name	Scientific Name	Status[1]
Sticky ringstem	*Anulocaulis leiosolenus* var. *leiosolenus*	NPS-Lake Mead NRA, BLM-NV
Las Vegas bearpoppy	*Arctomecon californica*	NPS-Lake Mead NRA, NV State CE, BLM-NV
White bearpoppy	*Arctomecon merriamii*	BLM-NV
Black woollypod	*Astragalus funereus*	BLM-NV
Threecorner milkvetch	*Astragalus geyeri* var. *triquetrus*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Straw milkvetch	*Astragalus lentiginosus* var. *stramineus*	BLM-NV
Mokiak milkvetch	*Astragalus mokiacensis*	NPS-Lake Mead NRA, BLM-NV
Alkali mariposa lily	*Calochortus striatus*	BLM-NV
Las Vegas catseye	*Cryptantha insolita*	NV State CE
Gold Butte moss	*Didymodon nevadensis*	BLM-NV
Silverleaf sunray	*Enceliopsis argophylla*	NPS-Lake Mead NRA, BLM-NV
Las Vegas buckwheat	*Eriogonum corymbosum* var. *nilesii*	FC (NV), BLM-NV, NV State CE
Sticky buckwheat	*Eriogonum viscidulum*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Catchfly gentian	*Eustoma exaltatum*	BLM-NV
Beaver Dam breadroot	*Pediomelum castoreum*	NPS-Lake Mead NRA, BLM-NV
White-margined beardtongue	*Penstemon albomarginatus*	BLM-NV
Yellow twotone beardtongue	*Penstemon bicolor* ssp. *bicolor*	BLM-NV
Rosy twotone beardtongue	*Penstemon bicolor* ssp. *roseus*	NPS-Lake Mead NRA, BLM-NV

Table 3.6-5 Special Status Plant Species Potentially Occurring in Region IV

Common Name	Scientific Name	Status[1]
Parish phacelia	*Phacelia parishii*	BLM-NV
St. George blue-eyed grass	*Sisyrinchium radicatum*	BLM-NV

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; NPS = NPS Sensitive; USFS = Forest Sensitive; NV State CE = NV State Critically Endangered; NV State CE# = NV State Recommended for Listing a Critically Endangered; NV State CY = NV State Protected as a Cacti, Yucca, or Christmas Tree.

3.6.6 Impacts to Special Status Plant Species

As described above, the analysis area for special status plant species encompasses the HUC 10 watershed boundaries crossed by the 2-mile transmission line corridor. For impacts, the discussions focus on the impacts resulting from construction and operation activities within the 2-mile transmission line corridor. Operation activities include maintenance activities for the transmission line. The 2-mile transmission line corridor consists of a one-mile buffer on each side of the reference center line. Within the 2-mile transmission line is located the 250-foot-wide transmission line ROW. The 250-foot-wide transmission line ROW would contain the surface footprint for all temporary and permanent facilities associated with construction and operation activities. Permanent and temporary access roads would be located within the 250-foot-wide transmission line ROW where practical. Within the 2-mile transmission line corridor and outside of the 250-foot-wide transmission line ROW, access roads would be the only surface disturbance. The access roads locations have not been defined at this time. Additional surface facilities outside the 2-mile transmission line corridor include terminals and electrode beds.

Occurrence potential within the 2-mile transmission line corridor was evaluated for each plant species based on habitat requirements (including associated geological formations, soil substrates, vegetation communities, and elevation range) and known distribution. Special status plant species that were identified as potentially occurring within the analysis area were carried forward for impact analysis. The special status plant species carried forward in this analysis include the following: 18 federally listed species, 115 BLM sensitive species, 20 Forest sensitive species, 8 NPS-Lake Mead NRA sensitive species, and 7 species with state protection, as listed in the previous sections and **Appendix G**, **Table G-1**. Impact issues and the analysis considerations for special status plant species within the 2-mile transmission line corridor are listed in **Table 3.6-6**. Due to the programmatic nature of the EIS, impacts to the special status plant species are discussed within the context of the 2-mile transmission line corridor with the assumption that impacts could occur anywhere within the 2-mile transmission line corridor. For the facilities located outside the 2-mile transmission line corridor, which include ground electrodes, and terminals, impacts to special status species are discussed within the context of the facilities' proposed footprints.

Table 3.6-6 Relevant Analysis Considerations for Special Status Plant Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Potential loss of individuals and/or suitable or occupied habitats as a result of construction and operation activities	The analysis will include a programmatic assessment of direct disturbance effects from temporary (i.e., construction-related) and permanent facility footprints.
Number of species whose range is limited to within or directly adjacent to the impact analysis area.	The analysis will evaluate impacts in the context of the range of the species and the 2-mile wide transmission line corridor, and facility footprints.

Table 3.6-6 Relevant Analysis Considerations for Special Status Plant Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Increased trampling or removal of aboveground vegetation	The analysis will evaluate partial and complete vegetation removal as a result of construction and operation activities (e.g., clearing, stringing, vehicles driving cross-country, etc.).
Increased habitat fragmentation from access road construction and operation	The analysis will evaluate indirect effects of habitat fragmentation as a result of an increased road network, edge effects, and presence of transmission line ROW.
Accumulation of fugitive dust from increased access roads and vehicle traffic	The analysis will evaluate indirect effects from increased fugitive dust emissions associated with roads and vehicles on a potential decrease in species and habitat productivity.
Potential for introduction and spread of noxious and invasive species from construction and operation activity	The analysis will evaluate indirect effects of potential introduction and spread of noxious weeds from construction equipment or vehicles, spreading from infested area into the undisturbed areas.
Potential for greater access to populations from collectors	The analysis will evaluate indirect effects associated with potential loss of species and suitable/potential habitat as a result of greater public access to populations for plant collectors, and increased non-Project-related motor vehicle use via an expanded road network and ROW system.
Potential loss of pollinators	The analysis will evaluate indirect effects associated with potential loss of pollinators due to fugitive dust emissions and habitat fragmentation.

Impact parameters were used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among the alternative routes and variations. The following impact parameters used for this analysis are:

- Acreage of potential habitat (based on species-specific modeling results) within the 2-mile transmission line corridors for federally listed and Forest sensitive plant species potentially impacted by the Project.
- Acreage of critical habitat within the 2-mile transmission line corridors for federally listed species potentially impacted by the Project.
- The presence of known individuals or populations within the 2-mile transmission line corridors for all special status plant species carried forward for detailed analysis that could be potentially impacted by the Project.
- The presence of potential habitat (based on preliminary desktop analysis) within the corridors for BLM sensitive, NPS-Lake Mead NRA sensitive, and state-listed plant species potentially impacted by the Project.
- Presence of species whose range is limited to within or directly adjacent to the 2-mile transmission line corridor.

Potential direct and indirect effects on special status plant species and their associated habitats as a result of construction, operation, and decommissioning activities are discussed below. After impacts are identified, relevant agency BMPs and design features are discussed in terms of reducing impacts. If significant impacts remain after application of BMPs and design features, additional mitigation is recommended to reduce impacts to non-significant levels.

The impacts analysis for special status plant species assumes that the USFWS will continue to have jurisdiction over the management of federally endangered, threatened, proposed, and candidate species populations. The BLM will continue to manage BLM sensitive species is accordance with BLM Manual 6840. The USFS will continue to manage Forest sensitive species in accordance with USFS Manual 2670. The National Park Service will continue to manage NPS sensitive species in accordance with the

Lake Mead General Management Plan (NPS 1986) and the Lake Mead NRA RMP (NPS 2002). In addition, the BLM, USFS, and NPS will continue to manage special status species habitats in coordination with USFWS.

3.6.6.1 Impacts from Terminal Construction and Operation

The northern and southern terminals would be constructed regardless of alternative route selection.

Northern Terminal

Direct and indirect impacts to special status plant species from construction and operation of the northern terminal can be grouped into two main categories: 1) loss of individuals and/or populations; and 2) loss of potentially suitable habitat. The habitat analysis is presented within a programmatic framework, given that site-specific disturbance locations and exact locations of suitable habitat (i.e., ground-verified potential habitat locations) are unknown. Species-specific impacts, as a result of construction and operation of the northern terminal, are presented in **Table 3.6-7**. Based on species occurrence information, no special status plant species populations are known within the northern terminal area.

Table 3.6-7 Impacts to Special Status Plant Species from Construction of the Northern and Southern Terminals

			Northern Terminal[2]		Southern Terminal[3]	
Common Name	**Scientific Name**	**Status[1]**	**Known Populations Impacted? (Y/N)**	**Potential Habitat Impacted? (Y/N)**	**Known Populations Impacted? (Y/N)**	**Potential Habitat Impacted? (Y/N)**
Meadow pussytoes	*Antennaria arcuata*	BLM-WY	N	Y	N	N
Meadow milkvetch	*Astragalus diversifolius*	BLM-WY	N	Y	N	N
Trelease's milkvetch	*Astragalus racemosus* var. *treleasei*	BLM-WY	N	Y	N	N
Ownbey's thistle	*Cirsium ownbeyi*	BLM-WY	N	Y	N	N
Gibbens penstemon (Gibbens beardtongue)	*Penstemon gibbensii*	BLM-WY, BLM-CO, BLM-UT	N	Y	N	N
Beaver Rim phlox	*Phlox pungens*	BLM-WY	N	Y	N	N
Tufted twinpod	*Physaria condensata*	BLM-WY	N	Y	N	N
Limber pine	*Pinus flexilis*	BLM-WY	N	Y	N	N
Persistent sepal yellowcress	*Rorippa calycina*	BLM-WY	N	Y	N	N
Ute ladies'-tresses	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE	N	Y	N	N
Laramie false sagebrush	*Sphaeromeria simplex*	BLM-WY	N	Y	N	N

[1] Status: BLM = BLM Sensitive; NPS = NPS Sensitive; NV-State CE = Nevada State Critically Endangered.

[2] Analysis encompasses the Northern Terminal Siting Area, within which the proposed Northern Terminal Site would be located.

[3] Analysis encompasses the Southern Terminal Siting Area, within which the proposed Southern Terminal Site and Southern Terminal Alternative Site would be located.

Based on species-specific habitat associations, potentially suitable habitats could be directly impacted as a result of construction implementation. Direct disturbance effects could include the loss of potential habitat as a result of ground clearing during construction, and the loss of potential habitat associated with the operational footprint of the terminal site.

Indirect effects associated with construction of the northern terminals could include the following: 1) establishment of noxious and invasive weed species during construction and operation; 2) loss of pollinators as a result of host species loss or fragmentation; and 3) accumulation of fugitive dust on vegetation species within suitable habitat, due to construction and operation vehicle and equipment use and resulting in reduced photosynthesis and habitat degradation. If pollinator populations occur within or adjacent to the terminal areas, a localized effect to host species may potentially occur. Given the lack of pollinator data associated with species dominating the various potential habitats within the terminal areas, the intensity of this impact is unknown.

Following completion of construction, 270 acres of disturbance would be reclaimed pursuant to TWE's PDTR (**Appendix D**). See Section 3.5, Vegetation, for a discussion of reclamation. At the end of the useful life of the Project, decommissioning would occur, the facilities would be dismantled and removed, and the entire terminal site would be reclaimed.

The applicant has committed to the following design features (i.e., environmental protection measures) to mitigate impacts to special status species as a result of the Project:

- TWE-12 – Minimizing surface disturbance in areas where soils and vegetation are sensitive to disturbance.
- TWE-13 – Restoration of temporary work areas;
- TWE-19 – Implementation of an Erosion Control Plan;
- TWE-26 – Implementation of a Vegetation Management Plan and Noxious Weed Management Plan; and
- TWE-29 – Implementation of a Biological Protection Plan.

Additional environmental protection measures that would apply to the Project include the WWEC performance standards (i.e., WWEC BMPs) which are listed in **Appendix C**. Also listed in **Appendix C** are the NSU and CSU restrictions which include restrictions for surface disturbance around wetlands, riparian areas, and drainages, and special status species populations. A brief overview of the WWEC performance standards applicable to special status plant species are listed below:

- AIR-1 – Cover stockpiled soil for fugitive dust;
- AIR-2 – Water surfaces prior to clearing or grading to prevent fugitive dust emissions;
- ECO-1/ECO-2/ECO-4 – Protection of sensitive and unique habitats;
- VEG-1 – Restoration using weed-free native species;
- VEG-2 – Development of an integrated vegetation management plan; and
- VEG-3 – Pesticide use stipulations.

Individual BLM FOs have FO-specific BMPs, and USFS forests have forest-specific stipulations and guidelines, that would apply to the Project within the boundaries of each FO and forest. Where there is conflict with the WWEC performance standards and individual BLM or USFS FO BMPs and stipulations and guidelines, the requirements of the individual offices will supersede the WWEC performance standards. Example of agency BMPs specific to special status plant species include:

- Conduct pre-Project habitat assessments and site inventories within suitable habitat to determine occupancy;
- Design Project infrastructure to minimize impacts within suitable habitat;
- Stay on designated roads, and other cleared/approved areas; and

- Use erosion control measures to avoid erosion on sedimentation into occupied habitat and avoidance areas.

In addition, the following mitigation measures for special status plant species are proposed:

***SS-1**: (Species-specific Surveys for Federally-listed Species) – Site- and species-specific surveys for federally listed plant species would be conducted prior to the BA to identify the precise location of known individuals and populations and ground-truth modeled habitats. Surveys would be conducted in areas identified as potential habitat through models developed for the EIS, or from agency provided models for specific species. Surveys would be conducted as described in the TWE Project Special Status Species Survey Plan and subsequent Survey Plan Memos. Species not requiring surveys prior to the BA would be identified by the USFWS and BLM. For these species, pre-construction surveys still would be required. If individuals or populations are identified during surveys in potential habitat areas, species-specific avoidance through structure and ROW design modifications would be developed and implemented. For species that cannot be avoided, species specific mitigation would need to be developed in consultation with the USFWS and BLM. Species-specific mitigation may include compensatory mitigation and transplanting of individuals.*

***SS-2**: (Species-specific Surveys for USFS Sensitive) – Site- and species-specific surveys for USFS sensitive plant species would be conducted prior to the BE to identify the precise location of known individuals and populations and ground-truth modeled habitats. Surveys would be conducted in areas identified as potential habitat through models developed for the EIS, or from agency provided models for specific species. Surveys for USFS sensitive species would be conducted only in the national forests crossed by the proposed Project. Surveys would be conducted as described in the TWE Project Special Status Species Survey Plan and subsequent Survey Plan Memos. Species not requiring surveys prior to the BE would be identified by the USFS and BLM. For these species, pre-construction surveys still would be required. If individuals or populations are identified, species-specific avoidance through structure and ROW design modifications would be developed and implemented. If individuals or populations are identified during surveys in potential habitat areas, species-specific avoidance through structure and ROW design modifications would be developed and implemented. For species that cannot be avoided, species specific mitigation would need to be developed in consultation with the USFS and BLM. Species specific mitigation may include compensatory mitigation and transplanting of individuals.*

***SS-3**: (Species-specific Surveys for BLM Sensitive, NPS Sensitive, and Nevada State Protected Species) – Site- and species-specific surveys for BLM sensitive, NPS sensitive, and Nevada state-protected plant species would be conducted prior to construction to identify the precise location of known individuals and populations and ground-truth modeled habitats. Surveys would be conducted as described in the TWE Project Special Status Species Survey Plan and subsequent Survey Plan Memos. If individuals or populations are identified, species-specific avoidance through structure and ROW design modifications would be developed and implemented.*

***SS-4**: (Avoidance of Ute Ladies'-tresses Orchid Species and Habitat) – Known individuals and populations and areas identified as potential habitat through consultation with the USFWS would be spanned by the transmission line. Surface disturbance associated with facilities, access roads, and other Project-related construction activities would not occur within the areas identified as potential habitat or within a 50-foot buffer around known occurrences. Presence of species in modeled habitat would be assumed for USFWS mitigation purposes. If potential habitat cannot be avoided, 2 years of surveys in potential habitat would be required, and USFWS formal consultation may be necessary.*

***SS-5**: Construction will occur down slope of special status plants and populations where feasible; if surface disturbance must be sited upslope, a 300-foot minimum buffer between surface disturbances and plants and populations will be incorporated. Erosion controls would be implemented at the direction of the BLM, USFS, or USFWS, as appropriate, to prevent sedimentation and erosion from upslope surface disturbance.*

***SS-6**: A minimum 300-foot buffer distance would be incorporated between federally listed individuals and populations and surface disturbance. Avoidance areas will be visible during construction through fencing, signing, rebar, etc. Construction and operation traffic will stay on designed routes, and other cleared or approved areas.*

Effectiveness: With implementation of mitigation measures **SS-1** through **SS-3**, in addition to TWE's design features, and the WWEC BMPs, no direct impacts to special status plant species and their associated suitable habitats within the Northern Terminal are anticipated. If species or habitat avoidance remains unfeasible, impact minimization and mitigation measures would be developed in consultation with the BLM, Western, USFWS, and USFS prior to construction. With implementation of mitigation measure **SS-4**, which would avoid surface disturbance in Ute ladies'-tresses orchid modeled habitat, in addition to WWEC BMPs, and TWE design features, no impacts to Ute ladies'-tresses orchid individuals or their associated habitats would be anticipated. With implementation of mitigation measure **SS-5**, erosion and sedimentation impacts to special status species would be minimized through Project design, avoidance buffers, and erosion controls. Implementation of mitigation measure **SS-6** would minimize impacts to federally listed individuals and populations through the use of avoidance buffers.

Southern Terminal

There are two sites proposed for the Southern Terminal site (Southern Terminal, and Southern Terminal Alternative). Both sites are located primarily on developed/disturbed land cover types. Within each of the Southern Terminal proposed sites, there are no known occurrences or potential habitat for special status plant species. Therefore, no impacts are anticipated to special status plant species at either of the proposed Southern Terminal sites.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Because the implementation of Design Option 2 would use the same alternative routes and construction techniques as the Project, impacts from construction and operation of this design option would be the similar to those discussed under the alternative routes. Differences between this design option and the Project include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The southern converter station would be located near IPP in Utah instead of at Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP.

Construction and operation of a converter station near IPP, ground electrode system, and series compensation station would similar to impacts described in Section 3.5.6.1, Impacts to Vegetation Resources from Terminal Construction and Operation. Impacts to special status plant species would be as described for Alternatives II-A, II-D, II-E, and the Southern Terminal locations.

Design Option 3 – Phased Build Out

Because the implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the Project, impacts from construction and operation of this design option would be similar to those discussed under the alternative routes. The total surface disturbance at one time might be less depending on the timing and reclamation activities associated with the phased build out.

3.6.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

Construction impacts would occur within the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, and the ancillary facility footprints. Within the 250-foot-wide transmission line ROW, surface disturbances would consist of ROW clearing in preparation of transmission line structure installation; and vegetation removal and blading to facilitate the construction of temporary and

permanent aboveground and belowground ancillary facilities. Within the 2-mile transmission line corridor, surface-disturbing activities would be limited to development and maintenance of temporary and permanent access roads.

Surface disturbances resulting from construction activities within the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, and at the ancillary facilities sites would impact special status plant species through the following: 1) loss of individuals and/or populations and 2) loss of potentially suitable habitat. Given that site-specific disturbance locations and exact locations of suitable habitat (i.e., ground-verified potential habitat locations) are unknown, the species and habitat analysis is presented herein using a programmatic approach. Further, it is assumed that any known occurrences or potential habitat located within the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, or the ancillary facilities footprint potentially would be impacted by the Project.

Direct disturbance effects on species could include the loss of individuals or local populations resulting from partial removal of vegetative material due to trampling or crushing from construction vehicles and equipment, or loss of individuals as a result of ROW clearing and construction of transmission line components. Trampling of vegetation could result in permanent loss of individuals and/or populations depending on the extent of vegetation removed and the resulting damage to the individual species. The Project would cross modeled potential habitat, field verified suitable habitat, and occupied habitat of many special status plant species, which are analyzed in detail below. As a result of construction activities, direct disturbance effects to sensitive species habitat could include the loss of suitable habitat as a result of trampling or crushing from construction equipment and ROW clearing; or loss of suitable habitat as a result of transmission line structure or ancillary facility placement, in the event that spanning or avoidance of habitat is unachievable.

The types of indirect impacts to special status plant species as a result of construction activities would include potentially increased erosion, sedimentation, fugitive dust, the spread and establishment of noxious and invasive weed species, habitat fragmentation, the potential loss of pollinators, and increased opportunities for illegal collection of individual special status plant species.

Construction activities may increase erosion and sedimentation, and modify the floodplain surface as well as channel beds and banks. The effects of erosion and sedimentation may create indirect impacts on nearby riparian vegetation or directly affect the habitats of special status plant species. Changes to surface overflow and increased sedimentation can also affect upland special status plant species. Erosion and sedimentation effects could affect special status species outside the 2-mile transmission line corridor that are downstream of construction activities. See Section 3.4, Water Resources, for more detail on the effects of sedimentation on drainages in and around the Project area. Fugitive dust accumulation may adversely impact photosynthesis, respiration, transpiration, water use efficiency, leaf conductance, growth rate, gas exchange, and growth vigor (USFWS 2008). Fugitive dust tends to be a greater issue in desert vegetation communities, barren sparsely vegetated areas, and sandy soils. Linear surface disturbances such as those associated with transmission lines and roads can and have provided corridors (Gelbard and Belnap 2003; Watkins et al. 2003) and serve as a source of propagules (D'Antonio et al. 2001) for further infestation of noxious weeds and invasive species into adjacent undisturbed areas. Localized surface disturbances can and have facilitated the invasion of noxious and invasive species by removing native vegetative cover, creating areas of bare ground (Burke and Grime 1996; Watkins et al. 2003), and increasing light and nutrient availability (Stohlgren et al. 2003, 1999). Noxious and invasive weed species compete with native plants, can degrade and modify native communities, and reduce resources for native species (e.g., moisture, soil nutrients, and light).

Habitat fragmentation could occur as a result of the increased number of access roads, the 250-foot-wide transmission line ROW, and long-term surface disturbance from transmission structures and permanent facilities. The anthropogenic fragmentation of special status plant species habitats can result in more isolated, smaller populations, decreased species density, adverse impacts to pollination, decreased reproductive success, increased edge effects, and increased competition from noxious and

invasive weed species. In addition, the increase in the number of access roads within and near occupied habitats would allow greater access to special status plant species populations. This potentially could increase illegal collection of the individual species. If pollinator populations occur within or adjacent to the ROW and temporary and permanent access roads, a localized effect to pollinator and host species may occur. Given the lack of pollinator data associated with species dominating the various potential habitats within the 2-mile transmission line corridors, the intensity and extent of this potential impact is unknown.

Typically, indirect impacts to plants occur 100 to 300 feet away from the construction impact (USFWS 2012), but could affect special status species communities further away such as through increased sedimentation into drainages affecting communities downstream. Indirect effects could occur to all species and habitats located within the construction ROW regardless of the avoidance of surface disturbance and construction activities within identified habitats and populations. BMPs and design features presented above and in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components (Vegetation) would be implemented to minimize and mitigate indirect impacts.

Following completion of construction, temporary use areas would be reclaimed pursuant to TWE's PDTR (**Appendix D**). See Section 3.5, Vegetation, for a more thorough discussion of reclamation. At the end of the useful life of the Project, decommissioning would occur, the facilities would be dismantled and removed, and the Project areas would be reclaimed. Areas characterized by arid conditions, soils reclamation constraints, and high local populations of noxious weeds would be difficult to reclaim to native vegetation. In these areas, impacts to special status species could be greater due to the difficulties in reclamation. Specifically, impacts to special status species in the San Rafael Swell would be greater and potentially longer lasting due to the arid, desert environment, and the prevalence of low reclamation potential soils in this area.

The implementation of BMPs and design features would the same as described under Section 3.5.6.1, Impacts from Terminal Construction and Operation. Additional Project design features to be implemented include:

- TWE-6 – Implementation of an Access Road Plan;
- TWE-14 – Construction of borrow pits; and
- TWE-47 – Implementation of a Dust Control and Air Quality Plan.

Additional WWEC BMPs that would apply to the Project include:

- WWEC BMPs – VEG-2 (integrated vegetation management plan development), SOIL-1 (topsoil salvage), SOIL-2 (slopes); WAT-10 (minimize stream crossings); WAT-11 (erosion controls at drainage crossings); and REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours).

An Access Road Plan would be developed and would incorporate relevant agency standards regarding road design, construction, maintenance, and decommissioning. In addition, the Access Road Plan would incorporate BMPs stipulated by the agencies in their respective decision documents and permits.

In addition, the following mitigation measure for special status plant species are proposed:

SS-7*: The Dust Control and Air Quality Plan will include dust abatement measures to minimize impacts to special status plant species including: slower speed limits on unpaved roads, using gravel for roads in occupied habitat and avoidance areas, and the application of water for dust abatement.*

Effectiveness: Implementation of mitigation measure **SS-7** would mitigate impacts to special status species resulting from fugitive dust.

Operation Impacts

The discussion of operation impacts includes maintenance activities for the transmission line. Direct and indirect impacts to special status plant species from operation of the alternative routes would result in the potential for: 1) loss of individuals and/or populations and 2) loss or degradation of potentially suitable habitat related to the use of access roads and the ROW for repair and maintenance activities and vegetation management. Impacts associated with operation activities would involve several of the same types of effects discussed for construction activities. Direct impacts would result from vegetation management activities occurring in special status plant species habitat, or if access for vegetation management requires vehicles traveling through special status plant species habitat. Vegetation management activities and their associated impacts are detailed in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Indirect impacts would be similar to those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation. Additional indirect impacts associated with operations would result from the vegetation management in the ROW. This would include effects from herbicide drift near special status plant species populations and habitats, and activities such as mowing and trimming of woody vegetation. For more information on vegetation management activities, see Section 3.5.6.2, Operation Impacts. The BMPs and design features presented above and in the referenced sections would be implemented to minimize and mitigate indirect impacts.

Decommissioning Impacts

Direct and indirect impacts to special status plant species associated with decommissioning and reclamation of the alternative routes are anticipated to be similar to those presented for construction impacts.

3.6.6.3 Region I Impacts

To determine the location and spatial extent of potentially suitable habitat for federally listed species within the 2-mile transmission line corridors, a habitat assessment was conducted using ArcGIS and best available GIS datasets based on species-specific habitat characteristics. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan. Species occurrence, range, and habitats in Region I are provided in **Appendix G**, **Table G-1**. **Table 3.6-8** provides acreages and numbers of special status plant species potentially impacted by the alternative routes in Region I based on known occurrences and potential habitat within the 2-mile transmission line corridors. In Region I, 23 BLM sensitive species and 1 federally listed species could be impacted by the Project.

Table 3.6-8 Summary of Region I Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Federally Listed Species				
Number of species with known occurrences impacted	0	0	0	0
Number of species with potential habitat impacted	1	1	1	1
Acreage of critical habitat impacted	--	--	--	--
Acreage of Ute ladies'-tresses Orchid potential habitat impacted	862	1,390	3,082	1,876
BLM Sensitive Species				
Number of species with known occurrences impacted	3	3	3	3
Number of species with potential habitat impacted	22	22	20	22

Alternative I-A (Applicant Proposed)

Ute Ladies'-tresses Orchid (Federally Threatened)

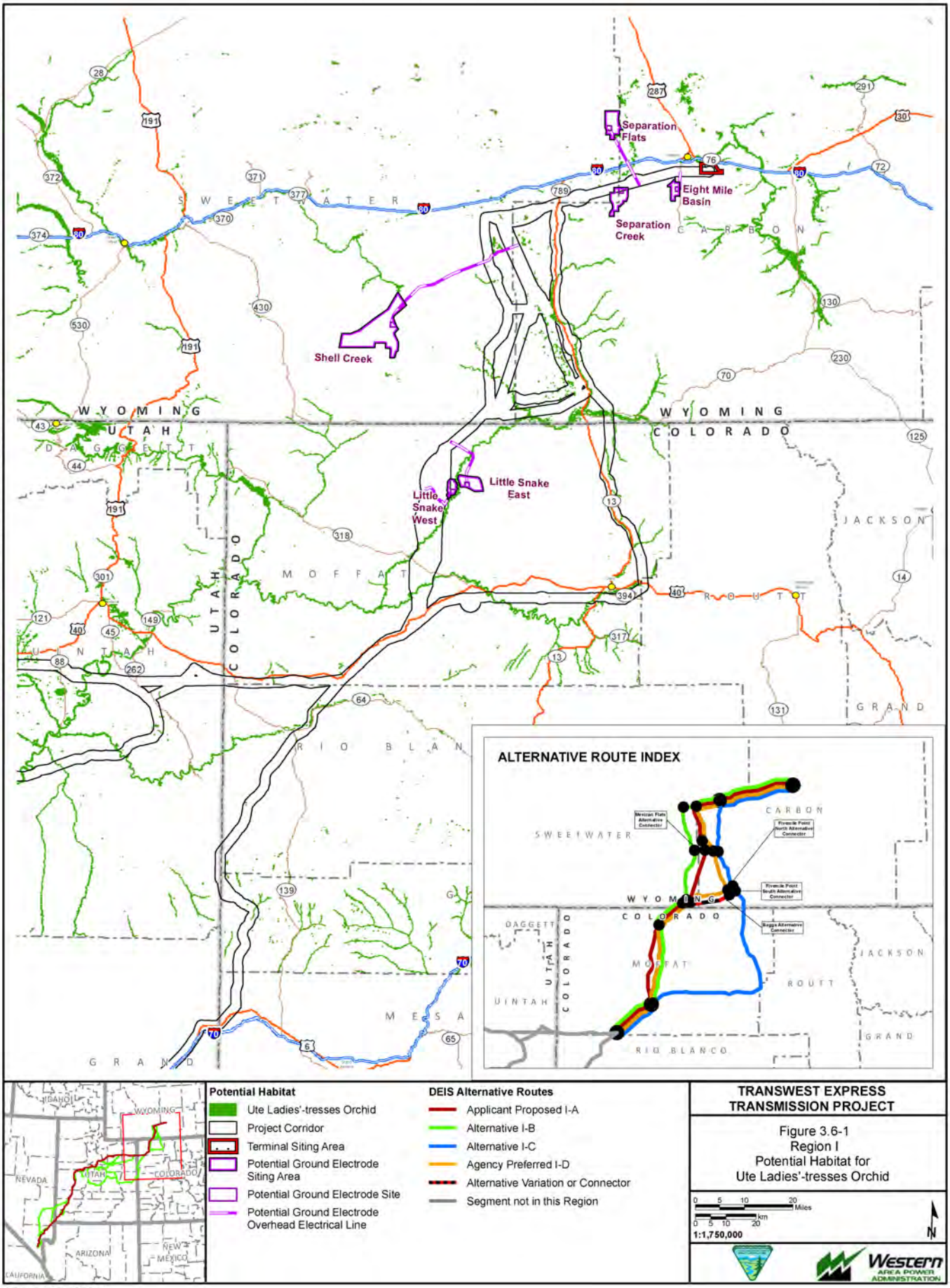
Within the 2-mile transmission line corridor for Alternative I-A, approximately 862 acres of potential habitat for the Ute ladies'-tresses orchid has been identified in the 2-mile transmission line corridor based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the Alternative I-A corridor. No critical habitat has been designated for this species. Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for the Northern Terminal Ute ladies'-tresses orchid analysis. Specifically, mitigation measure **SS-2** would be implemented to avoid Ute ladies'-tresses potential habitat. Therefore, no impacts to Ute ladies'-tresses orchid and its associated habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative I-A 2-mile-wide corridor: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 22 BLM sensitive species within the Alternative I-A corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**.

Impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. The BLM sensitive species with known locations and habitats within the corridors are located in a variety of habitats including barren, sparsely vegetated areas; shrub and woodland communities on the Green River formation, rocky outcrops, and sandy soils; and wetland and riparian areas. Two species (the cushion milkvetch and strigose Easter daisy) did not have available habitat information; therefore, a conservative analysis was applied for these species, which were carried forward within the impact analysis. Impacts to species in habitats with low reclamation potential such as rocky outcrops, sandy soils, and barren, sparsely vegetated areas would greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate potential impacts to BLM sensitive species habitats. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species or habitat avoidance to BLM sensitive species is deemed infeasible based on physical, other biological, or engineering constraints, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. In such case, impact minimization and additional mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated. As there is currently no designated critical habitat in the corridor, no impacts to critical habitat are anticipated.



Potential Habitat

- Ute Ladies'-tresses Orchid
- Project Corridor
- Terminal Siting Area
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-1
Region I
Potential Habitat for
Ute Ladies'-tresses Orchid

0 5 10 20 Miles
0 5 10 20 km
1:1,750,000
N

Western AREA POWER ADMINISTRATION

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Alternative I-B

Ute Ladies'-tresses Orchid (Federally Threatened)

Within the 2-mile-wide corridor for Alternative I-B, approximately 1,390 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the Alternative I-B 2-mile-wide corridor. No critical habitat has been designated for this species.

Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to Ute ladies'-tresses orchid species and their associated habitat are anticipated. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the corridors associated with Alternative I-B: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 22 BLM sensitive species within the corridors associated with Alternative I-B. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to special status plants under Alternative I-B would be the same as those described above for Alternative I-A BLM Sensitive Species.

Alternative I-C

Ute Ladies'-tresses Orchid (Federally Threatened)

Within Alternative I-C, approximately 3,082 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the corridors associated with Alternative I-C. No critical habitat has been designated for this species.

Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to the Ute ladies'-tresses orchid or its habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the corridors associated with Alternative I-C: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 20 BLM sensitive species within the corridors associated with Alternative I-C. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts would be the same as described above for Alternative I-A BLM Sensitive Species.

Alternative I-D (Agency Preferred)

Ute Ladies'-tresses Orchid (Federally Threatened)

Within Alternative I-D, approximately 1,876 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the corridors associated with Alternative I-D. No critical habitat has been designated for this species.

Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for Alternative I-A; therefore, no impacts to Ute ladies'-tresses orchid species and their associated habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the 2-mile-wide corridors associated with Alternative I-D: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 22 BLM sensitive species within the Alternative I-D 2-mile-wide corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Impacts would be the same as those described above for Alternative I-A BLM Sensitive Species.

Along Alternative I-D, three micro-siting options exist in the area of the Tuttle Easement. The only federal species identified as having potential habitat in the micro-siting area is the Ute ladies'-tresses orchid. The micro-siting options do not differ from each other or the comparable portion of Alternative I-D in their effects on the Ute ladies'-tresses orchid's potential habitat.

Alternative Connectors in Region I

Table 3.6-9 summarizes the impacts and advantages/disadvantages associated with the four alternative connectors in Region I based on known occurrences and potential habitat identified within the 2-mile transmission line corridors.

Table 3.6-9 Summary of Region I Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Impact Conclusion
Fivemile Point North Alternative Connector	One BLM sensitive species (Gibbens penstemon) is known to occur within the 2-mile transmission line corridor and could be impacted by Project-related activities. Potential habitat for one federally listed species (Ute ladies'-tresses orchid) [approximately 9 acres] is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for six BLM sensitive species (meadow pussytoes, Trelease's milkvetch, Ownbey's thistle, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species; and habitat disturbance to one federally listed species and six BLM sensitive species.
Fivemile Point South Alternative Connector	One BLM sensitive species (Gibbens penstemon) is known to occur within the 2-mile transmission line corridor and could be impacted by Project-related activities. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 18 acres]) is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for six BLM sensitive species (meadow pussytoes, Trelease's milkvetch, Ownbey's thistle, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species; and habitat disturbance to one federally listed species and six BLM sensitive species.
Mexican Flats Alternative Connector	Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 196 acres]) is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for six BLM sensitive species (meadow pussytoes, Trelease's milkvetch, Ownbey's thistle, Cedar Rim thistle, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to one federally listed species and six BLM sensitive species.

Table 3.6-9 Summary of Region I Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Impact Conclusion
Baggs Alternative Connector	One BLM sensitive species, (Gibbens penstemon is known to occur within the 2-mile transmission line corridor and could be impacted by Project-related activities. This population of Gibbens penstemon is the largest known population of the species in Wyoming (BLM 2012b). Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 650 acres]) is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for eight BLM sensitive species (Meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Cedar Rim thistle, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species' and habitat disturbance to one federally listed species and eight BLM sensitive species.

Alternative Ground Electrode Systems in Region I

The northern alternative ground electrode system would be required within 100 miles of the northern terminal, which is based on the conceptual locations and connections to the alternative routes. **Table 3.6-10** provides a comparison of impact parameters associated with the alternative ground electrode systems in Region I based on known occurrences and potential habitat identified within the ground electrode system siting areas. Based on species occurrence information and habitat associations, 17 special status plant species may be impacted by construction and operation of the ground electrode systems in Region I including 16 BLM sensitive species and one federally listed species (Ute ladies'-tresses orchid).

Table 3.6-10 Summary of Region I Alternative Ground Electrode System Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Separation Flat – All Alternative Routes	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 48 acres]) is located within the ground electrode system siting area and could be impacted by Project-related activities. • Potential habitat for six BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area and could be impacted by Project-related activities.
Shell Creek (Alternatives I-A, I-B, and I-D)	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 1 acre]) is located within the ground electrode system siting area and could be impacted by Project–related activities. • Potential habitat for nine BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Cedar Rim thistle, stemless beardtongue, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area, and could be impacted by Project-related activities.

Table 3.6-10 Summary of Region I Alternative Ground Electrode System Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Little Snake East (Alternatives I-A, I-B, and I-D)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Potential habitat for seven BLM sensitive species (cushion milkvetch, Duchesne milkvetch, starvling milkvetch, tufted cryptantha, single stemmed wild buckwheat, Nuttall sandwort, and matted fiddleleaf) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.
Little Snake West (Alternatives I-A, I-B, and I-D)	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 7 acres]) is located within the ground electrode system siting area and could be impacted by Project–related activities. • Potential habitat for seven BLM sensitive species (cushion milkvetch, Duchesne milkvetch, starvling milkvetch, tufted cryptantha, single-stemmed wild buckwheat, Nuttall sandwort, and matted fiddleleaf) is located within this ground electrode system siting area, and could be impacted by Project-related activities.
Eight Mile Basin (All Alternative Routes)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Potential habitat for six BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area and could be impacted by Project-related activities.
Separation Creek (All Alternative Routes)	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 0.2 acre]) is located within this ground electrode system siting area and could be impacted by Project-related activities. • Potential habitat for six BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area and could be impacted by Project-related activities.

Region I Conclusion

Within Region I, only potential habitat for one federally listed species is found in the 2-mile-wide corridor for Alternatives I-B and I-D. Based on the implementation of proposed mitigation measure **SS-2**, which would avoid surface disturbance in all potential modeled habitat, no impacts to Ute ladies'-tresses orchid and its associated habitat are anticipated. Impacts to BLM species would be similar between the various alternatives. There would be no impacts to USFS species within any of the Alternatives.

3.6.6.4 Region II

Table 3.6-11 provides a comparison of impact parameters for special status plant species associated with the alternative routes in Region II based on known occurrences and potential habitat identified within the 2-mile transmission line corridor. Based on species occurrence information and habitat associations, the special status plant species that may be impacted by the Project in Region II include 62 BLM sensitive species, 18 USFS sensitive species, and 14 federally listed species. To determine the locations and spatial extents of potentially suitable habitats for federally listed species and USFS sensitive species within the 2-mile transmission line corridor alternatives, a detailed habitat assessment was conducted using ArcGIS and best available GIS datasets based on species-specific habitat parameters. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan. Species occurrence and associated habitats in Region II are summarized in **Appendix G**, **Table G-1**.

Table 3.6-11 Summary of Region II Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Federally Listed Species						
Number of species with known occurrences impacted	2	1	2	3	4	5
Number of species with potential habitat impacted	6	8	9	6	5	8
Acreage of critical habitat impacted	N/A	N/A	N/A	N/A	N/A	N/A
Acreage of Barneby Ridgecress potential habitat impacted	4,112	0	0	0	0	0
Acreage of Clay Phacelia potential habitat impacted	226	0	0	0	2,645	2,645
Acreage of Clay Reed-mustard potential habitat impacted	0	0	0	3,607	0	3,607
Acreage of Colorado Hookless Cactus potential habitat impacted	0	5,338	5,338	0	0	0
Acreage of Deseret Milkvetch potential habitat impacted	785	0	0	0	785	785
Acreage of Graham's Penstemon potential habitat impacted	694	1,713	1,713	9,077	15,080	18,622
Acreage of Jones Cycladenia potential habitat impacted	0	17	1,004	0	0	0
Acreage of Last Chance Townsendia potential habitat impacted	0	383	8,068	0	0	0
Acreage of San Rafael Cactus potential habitat impacted	0	0	868	0	0	0
Acreage of Shrubby Reed-mustard potential habitat impacted	0	0	0	108	0	108
Acreage of Uinta Basin Hookless Cactus potential habitat impacted	0	0	0	54,839	0	54,839
Acreage of Ute ladies'-tresses Orchid potential habitat impacted	3,357	892	692	1,167	3,900	2,228
Acreage of Winkler Cactus potential habitat impacted	0	5,320	3,665	0	0	0
Acreage of White River Beardtongue potential habitat impacted	34	3,058	3,058	403	343	403
Acreage of Wright Fishhook Cactus potential habitat impacted	0	44,995	50,421	0	0	0
BLM Sensitive Species						
Number of species with known occurrences impacted	6	12	17	9	11	10
Number of species with potential habitat impacted	29	36	43	32	32	34

Table 3.6-11 Summary of Region II Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
USFS Sensitive Species[1]						
Number of species with known occurrences impacted	0	1	2	2	2	2
Number of species with potential habitat impacted	3	7	7	7	6	9
Acreage of Arizona Willow potential habitat impacted	0	0	5,478	0	0	0
Acreage of Bicknell Milkvetch potential habitat impacted	0	0	3,182	0	0	0
Acreage of Canyon Sweetvetch potential habitat impacted	0	1,433	0	4	0	0
Acreage of Carrington Daisy potential habitat impacted	0	172	0	0	0	0
Acreage of Dainty Moonwort potential habitat impacted	91	0	0	3	3	7
Acreage of Duchesne Greenthread potential habitat impacted	0	0	0	3,513	9,593	3,528
Acreage of Elsinore Buckwheat potential habitat impacted	0	0	3,299	0	0	0
Acreage of Goodrich Blazingstar potential habitat impacted	0	0	0	731	7,219	1,158
Acreage of Link Trail Columbine potential habitat impacted	0	321	0	0	0	0
Acreage of Maguire Campion potential habitat impacted	0	4,312	3,709	6,509	0	0
Acreage of Nevada Willowherb potential habitat impacted	0	561	2,158	0	0	561
Acreage of Sigurd Townsendia potential habitat impacted	0	975	4,520	0	0	975
Acreage of Slender Moonwort potential habitat impacted	1,812	0	0	0	152	608
Acreage of Untermann's Daisy potential habitat impacted	0	0	0	3,556	11,284	3,766
Acreage of Ward Beardtongue potential habitat impacted	0	1,322	20,825	0	0	1,322
Acreage of Wasatch Jamesia potential habitat impacted	6,582	0	0	4	343	343

[1] Although carried forward in detailed analysis due to their status as BLM sensitive species, potential habitat for the Creutzfeldt-flower (USFS-Manti-La Sal NF) and the Maguire daisy (USFS-Fishlake NF) on USFS-administered lands was not identified.

Alternative II-A (Applicant Proposed)

Deseret Milkvetch (Federally Threatened)

As presented in **Table 3.6-11** and illustrated in **Figure 3.6-2**, approximately 785 acres of potential habitat for the Deseret milkvetch would be impacted under Alternative II-A in the 2-mile-wide corridor. In addition, the only population of the Deseret milkvetch is located within the 2-mile transmission line corridor. Currently, the USFWS is reviewing a proposal to delist the species due to lack of the threats (USFWS 2011a). Implementation of Alternative II-A potentially would represent a new threat to the species that may result in the USFWS making the determination to not delist the species (USFWS 2012b).

To mitigate Project-related impacts to the Deseret milkvetch, the following proposed mitigation measure would be implemented:

SS-8*: (Avoidance of Deseret Milkvetch Species and Habitat) - Known individuals and populations and areas identified as ground-truthed suitable habitat would be spanned by the transmission line. Surface disturbance associated with facilities, access roads, and other Project-related construction activities would not occur within a 984-foot (300-meter) buffer around the areas identified as having known occurrences or suitable habitat. Presence of species would be assumed for development of USFWS conservation measures as appropriate.*

Effectiveness: WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to avoid, minimize, and mitigate any potential impacts to the Deseret milkvetch. In this area, the 2-mile transmission line corridor has been widened to allow for the 250-foot-wide transmission line ROW to be routed around the Deseret milkvetch. With the implementation of proposed mitigation measure **SS-8** in addition to the BMPs, design features, and TWE's applicant-committed measures, no impacts to the desert milkvetch and its associated habitat would be anticipated.

Indirect impacts would be mitigated through implementation of mitigation measures **SS-5**, **SS-6**, and **SS-7**. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

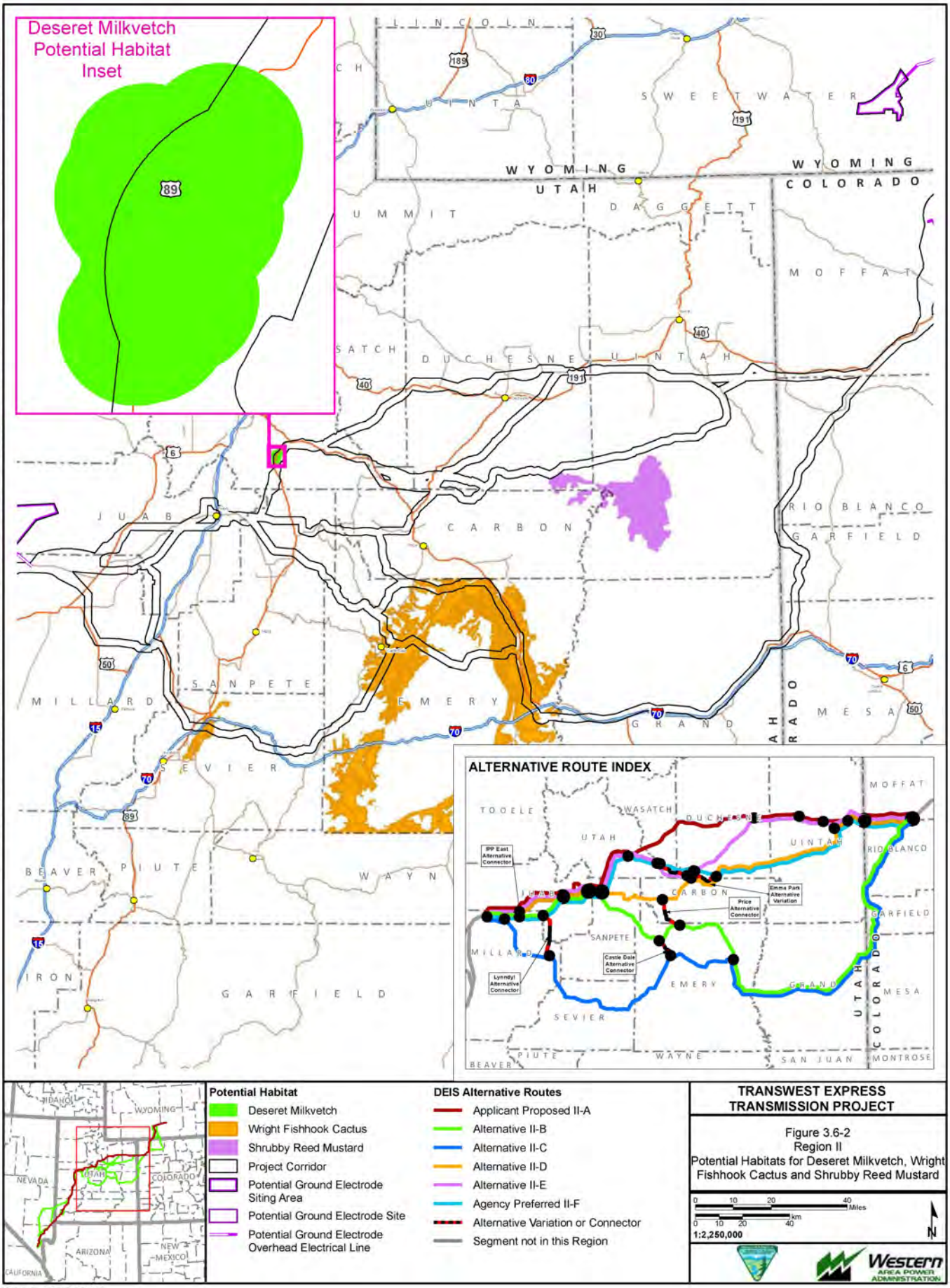
Ute Ladies'-tresses Orchid (Federally Threatened)

As presented in **Table 3.6-11** and illustrated in **Figure 3.6-1**, within the Alternative II-A 2-mile-wide corridor there are approximately 3,357 acres of potential habitat for the Ute ladies'-tresses orchid and the orchid has been documented within this corridor. No critical habitat has been designated for this species.

BMPs, design features, mitigation measures and their effects would be similar to those presented for Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to Ute ladies'-tresses orchid and its associated habitat is anticipated.

Federal Species Identified as having Potential Habitat

Within the 2-mile-wide corridor for Alternative II-A, there is potential habitat identified for Barneby ridgecress, clay phacelia, Graham's penstemon, and White River beardtongue (**Table 3.6-11**, **Figures 3.6-3**, **3.6-4**, and **3.6-5**). Based on species occurrence data and agency consultation, no individuals or populations of these species have been documented within Alternative II-A corridor. Additionally, no critical habitat has been designated for these species.


Deseret Milkvetch
Potential Habitat
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ALTERNATIVE ROUTE INDEX
Potential Habitat
Deseret Milkvetch
Wright Fishhook Cactus
Shrubby Reed Mustard
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-2
Region II
Potential Habitats for Deseret Milkvetch, Wright Fishhook Cactus and Shrubby Reed Mustard
1:2,250,000
Western AREA POWER ADMINISTRATION
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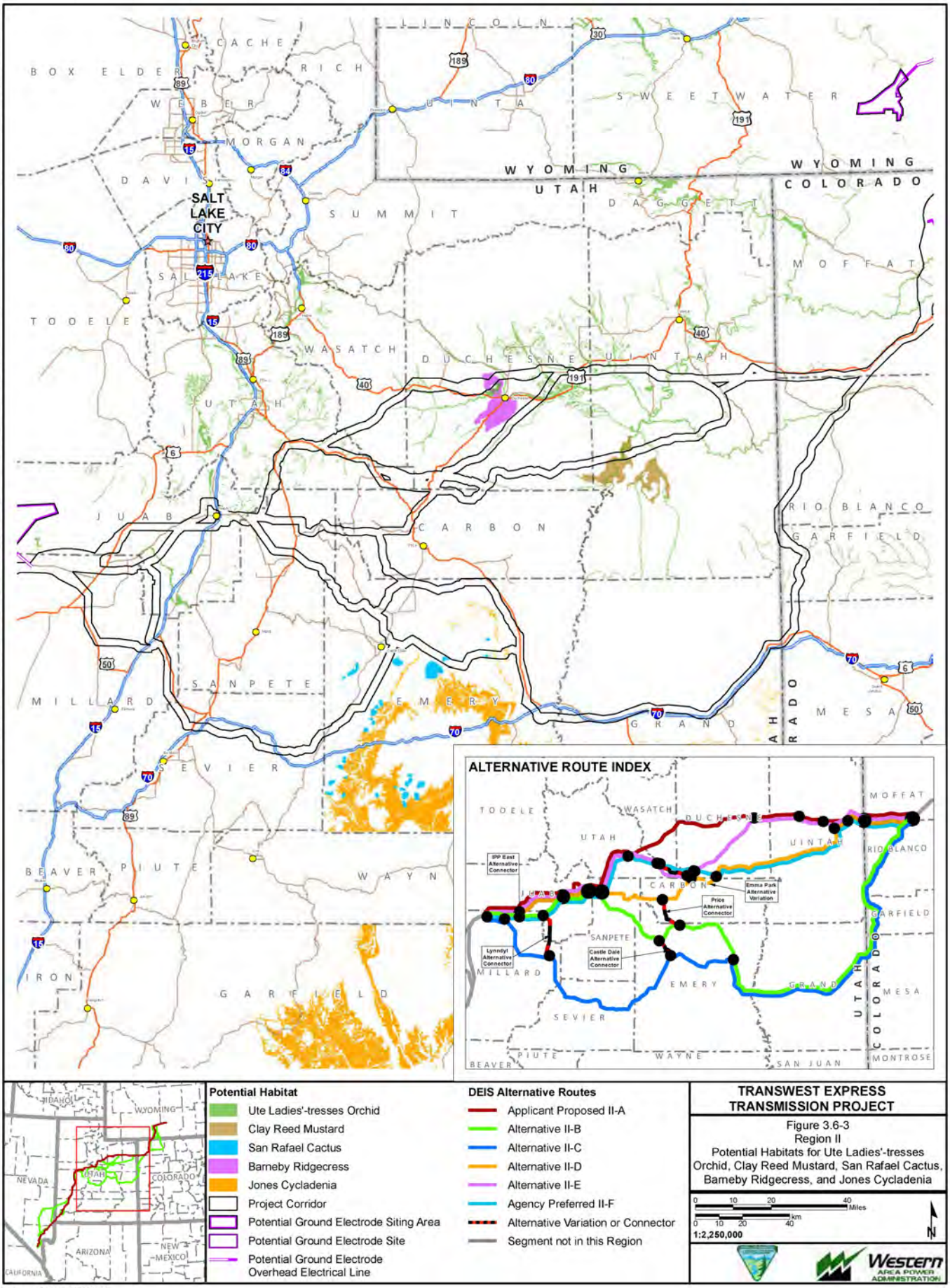

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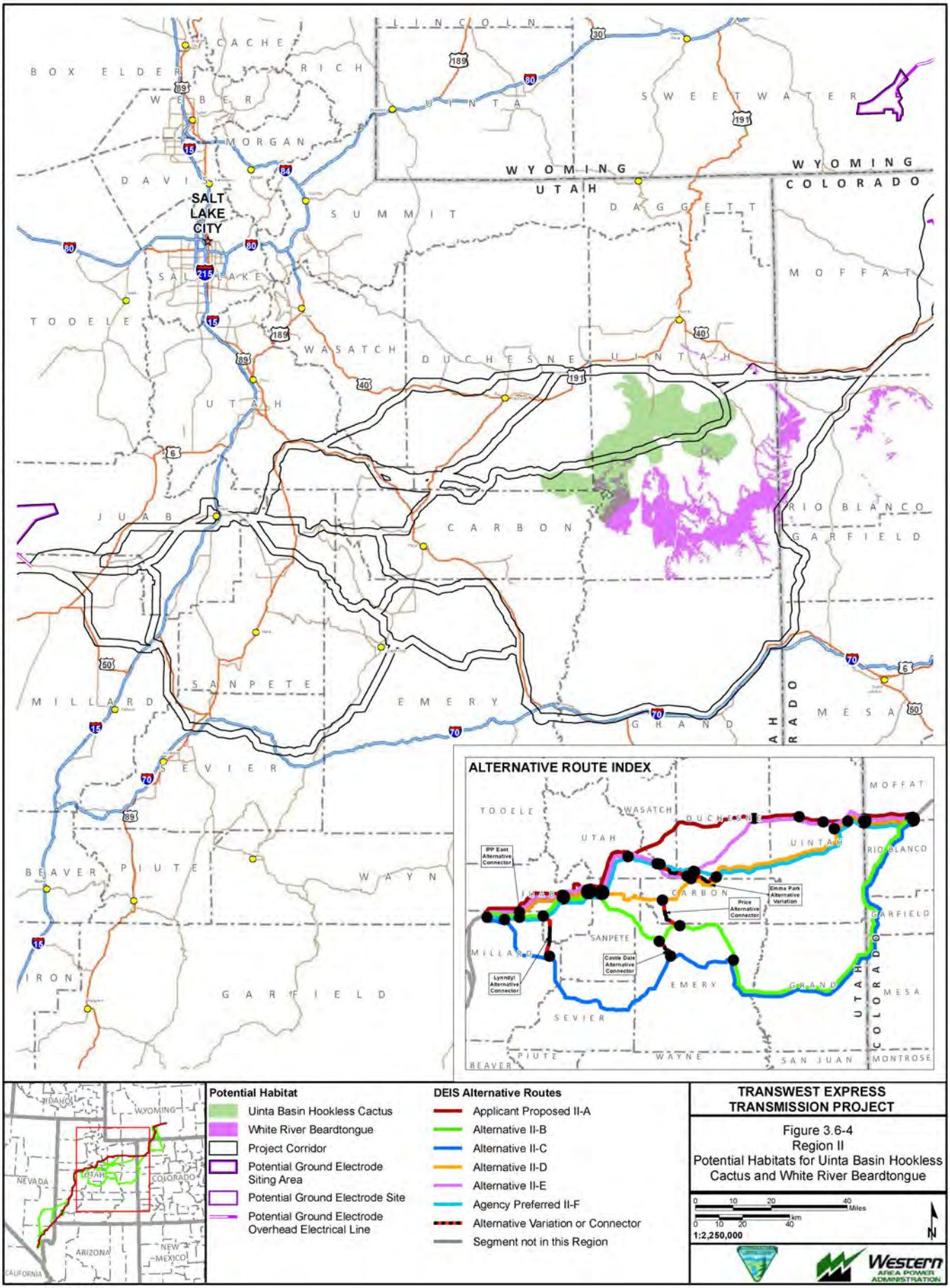
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CARBON
RIO BLANCO
GARFIELD
MILLARD
SANPETE
EMERY
GRAND
MESA
SEVIER
BEAVER
PIUTE
WAYNE
IRON
GARFIELD
ALTERNATIVE ROUTE INDEX
IPP East Alternative Connector
Emma Park Alternative Variation
Price Alternative Connector
Castle Dale Alternative Connector
Lynndyl Alternative Connector
MONTROSE
SAN JUAN
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
Potential Habitat
Uinta Basin Hookless Cactus
White River Beardtongue
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-4
Region II
Potential Habitats for Uinta Basin Hookless Cactus and White River Beardtongue
0 10 20 40 Miles
0 10 20 40 km
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Western AREA POWER ADMINISTRATION
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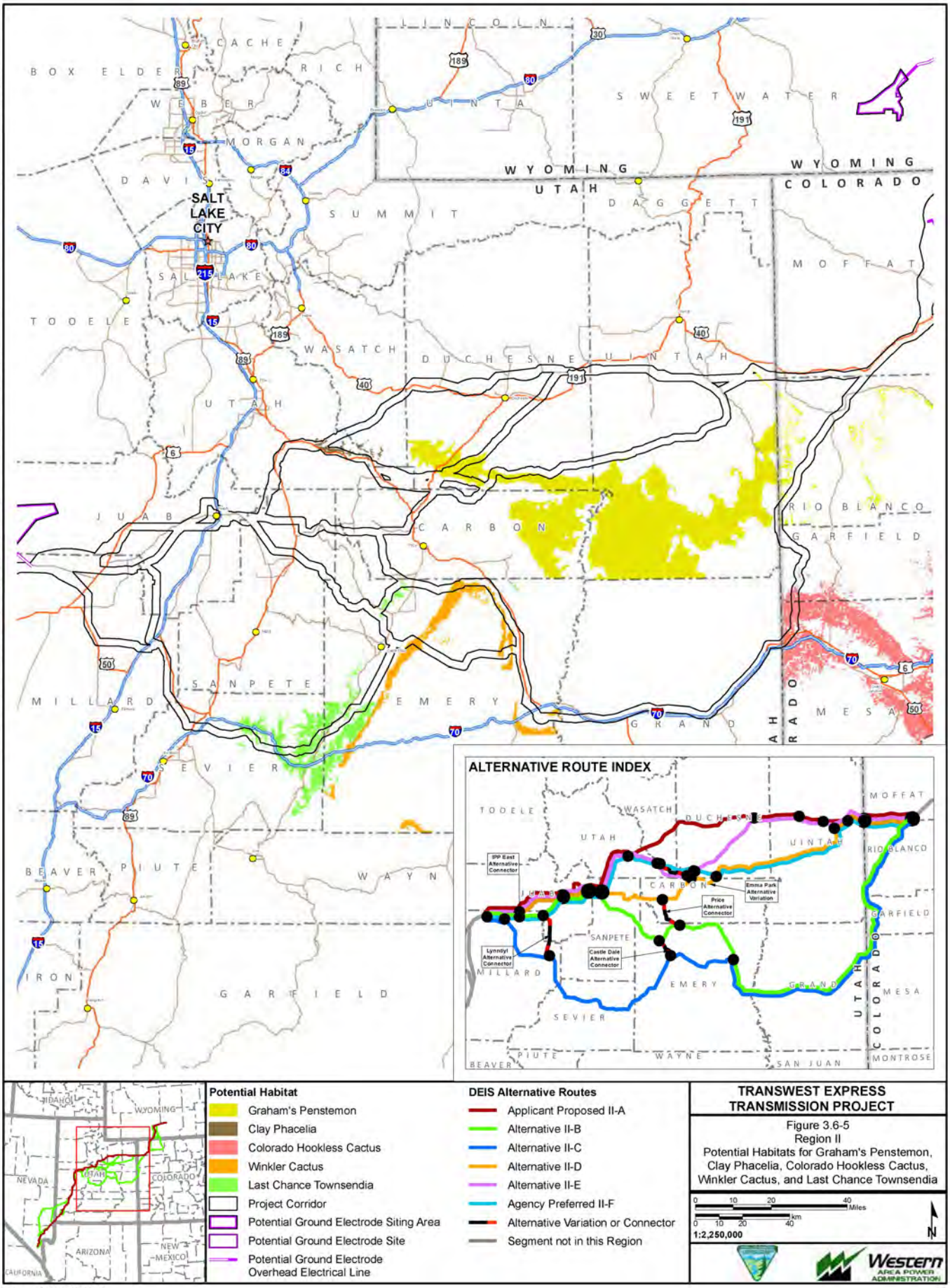
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IRON
GARFIELD
EMERY
GRAND
CARBON
DUCHESNE
UINTAH
LINCOLN
SWEETWATER
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
RIO BLANCO
GARFIELD
MESA
ALTERNATIVE ROUTE INDEX
IPP East Alternative Connector
Emma Park Alternative Variation
Price Alternative Connector
Lynndyl Alternative Connector
Castle Dale Alternative Connector
MONTROSE
SAN JUAN
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
Potential Habitat
Graham's Penstemon
Clay Phacelia
Colorado Hookless Cactus
Winkler Cactus
Last Chance Townsendia
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-5
Region II
Potential Habitats for Graham's Penstemon, Clay Phacelia, Colorado Hookless Cactus, Winkler Cactus, and Last Chance Townsendia
Miles
km
1:2,250,000
N
Western AREA POWER ADMINISTRATION
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Approximately 4,112 acres of potential habitat was identified for the Barneby ridgecress and approximately 226 acres of potential habitat was identified for clay phacelia within the 2-mile transmission line corridor. Less than 1,000 acres of potential habitat for the Graham's penstemon and White River beardtongue was modeled within the 2-mile transmission line corridor.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2 Impacts Common to All Alternative Routes and Associated Components, would be implemented to avoid, minimize, and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation measures **SS-3** and **SS-4**.

Based on the small area of potential habitat that was identified for the species and the distribution of the habitat in the 2-mile-wide corridor, allowing the habitat to be only spanned by the transmission line, no impacts to this species under Alternative II-A is anticipated. If species or habitat avoidance is deemed infeasible based on physical, other biological, or engineering constraints, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. At such time, impact minimization and additional mitigation measures would be developed in consultation with the BLM and Western prior to construction.

The limited range of clay phacelia is located predominantly within the 2-mile transmission line corridor. Also located in the 2-mile transmission line corridor, are relocation areas for the species. Known occurrences of the species are found along the 2-mile transmission line corridor on steep slopes on fine textured soil and fragmented shale derived from the Green River Formation. As the species grows on barren, precipitous hillsides, and fine textured soil, it is extremely susceptible to erosion and sedimentation. Reclamation of the habitat for this species is difficult due to the steep slopes of its habitat. The known occurrences are located near the main highway in the corridor. The habitat for the species is found throughout the corridor in the area. Based on the current reference line, the known locations for the species would be avoided; however, the species could be impacted by erosion from construction activities based on its proximity between the main highway and the potential locations for the proposed transmission line.

To mitigate Project-related impacts to clay phacelia, the following mitigation measures are proposed:

SS-9*: (Avoidance of Clay Phacelia and minimization of indirect impacts) – Known individuals and populations would be spanned by the transmission line. Surface disturbance associated with facilities, access roads, and other Project-related construction activities would not occur within a 984-foot (300-meter) buffer around areas identified as having known occurrences. Additional site-specific erosion control measures would be developed with the USFWS and implemented during construction to minimize erosion in areas near known clay phacelia populations. Site-specific construction techniques developed in consultation with the USFWS, BLM, and USFS would be used to minimize the amount of surface disturbance (such as installing structures with helicopter).*

SS-10*: (Avoidance of High Quality Habitats) – In instances where complete habitat avoidance is not possible (due to, for example, topographical, biological, or engineering constraints), all "high quality" habitats as determined during site- and species-specific surveys would be avoided by all direct disturbances during construction and operational activities. High quality habitat are defined as areas that are within the geographic range of the species, have been field verified as having the majority of required habitat characteristics; and/or the species has been observed in the area or near vicinity.*

Effectiveness: Upon completion of Mitigation Measure **SS-1**, the spatial extent of suitable habitats, in addition to a quantification of habitat quality based on species-specific habitat parameters, would be

identified for each federally listed species. Implementation of **SS-6** and **SS-9** would prevent direct impacts to clay phacelia individuals and minimize indirect impacts from erosion resulting from surface-disturbing activities. Total avoidance of clay phacelia habitat is unlikely in this corridor; however, with implementation of mitigation measure **SS-9** and **SS-10**, in conjunction with mitigation measure **SS-1** and **SS-3**, WWEC BMPs and TWE's design features, impacts to high quality habitats would be avoided. The areas not avoided would result in loss of suitable habitat for the species. Loss of suitable habitat or direct and indirect impacts to clay phacelia individuals likely would result in a decision of jeopardy for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following BLM-listed sensitive species have been identified within the Alternative II-A 2-mile- transmission line corridor: Neese narrowleaf penstemon, debris milkvetch, giant fourwing saltbush, Graham's penstemon, horseshoe milkvetch, and narrowstem gilia. Based on a desktop review, potential habitat has been identified for 29 BLM sensitive species within the Alternative II-A corridor. Associated species' ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Under this alternative, impacts to BLM-listed sensitive species would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. The BLM sensitive species with known locations and habitat within the Alternative II-A corridor include species that are found across a wide range of habitats as well as those that are only found on very specific soil and vegetation combinations. The habitats include dunes, barren, sparsely vegetated areas, shrub and juniper communities, rocky ridge tops, and desert shrublands. Two species (the cushion milkvetch and strigose Easter daisy) do not have available habitat information; therefore, a conservative analysis was applied for these species, which were carried forward through the impact analysis. Impacts to species in low reclamation-potential habitats such as rocky ridgetops, sandy soils, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the timeframe needed to restore woody communities.

The WWEC BMPs, and TWE's design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance of BLM sensitive species is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on implementation of the WWEC BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated under Alternative II-A.

USFS Sensitive Species

Based on species occurrence data and agency consultation, there are no USFS-listed sensitive species that have been identified within the Alternative II-A 2-mile-transmission line corridor. Based on a desktop review, potential habitat has been identified for the following three USFS sensitive species within the Alternative II-A corridor: dainty moonwort, slender moonwort, and Wasatch jamesia. The dainty moonwort and slender moonwort are listed in the Ashley and Uinta-Wasatch-Cache national forests; the Wasatch jamesia is listed in the Uinta-Wasatch-Cache National Forest. Associated species range and

habitat descriptions for these species are provided in **Appendix G, Table G-1**. Potential habitats for the aforementioned species are shown in **Figures 3.6-6**, **3.6-7**, and **3.6-8**.

Potential habitat for the dainty moonwort totals approximately 91 acres within and adjacent to the two forests within the analysis area. The dainty moonwort is found in wet, marshy, and spring areas around 8,000 feet amsl. Potential habitat for the slender moonwort totals approximately 1,812 acres within the Uinta National Forest. Within the analysis area, the slender moonwort is found above 9,000 feet amsl in riparian and wet areas. Potential habitat for the Wasatch jamesia totals approximately 6,582 acres within the Uinta National Forest. For all three species, all known occurrences are located outside of the 2-mile transmission line corridors.

Since no individuals or populations of USFS-listed sensitive species were identified within the 2-mile transmission line corridor, direct impacts to these species are not anticipated. If USFS sensitive species are identified during site-specific surveys, impacts would be avoided as per mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components and impact minimization and mitigation measures would be developed in consultation with the USFS, and Western prior to construction.

To minimize and mitigate impacts to all potential habitats within the 2-mile transmission line corridors, WWEC BMPs, design features, and proposed mitigation, as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation measures **SS-5** and **SS-6**. Based on the limited amount of potential habitat identified for the dainty and slender moonworts, it is anticipated that potential habitat avoidance would be feasible. Given the spatial extent of potential habitat identified for the Wasatch jamesia, complete habitat avoidance may not be possible. To minimize impacts to Wasatch jamesia habitat, mitigation measure **SS-10** would be applied; however, the areas not avoided would result in loss of potential habitat for the species. In these areas, direct and indirect impacts to the species would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

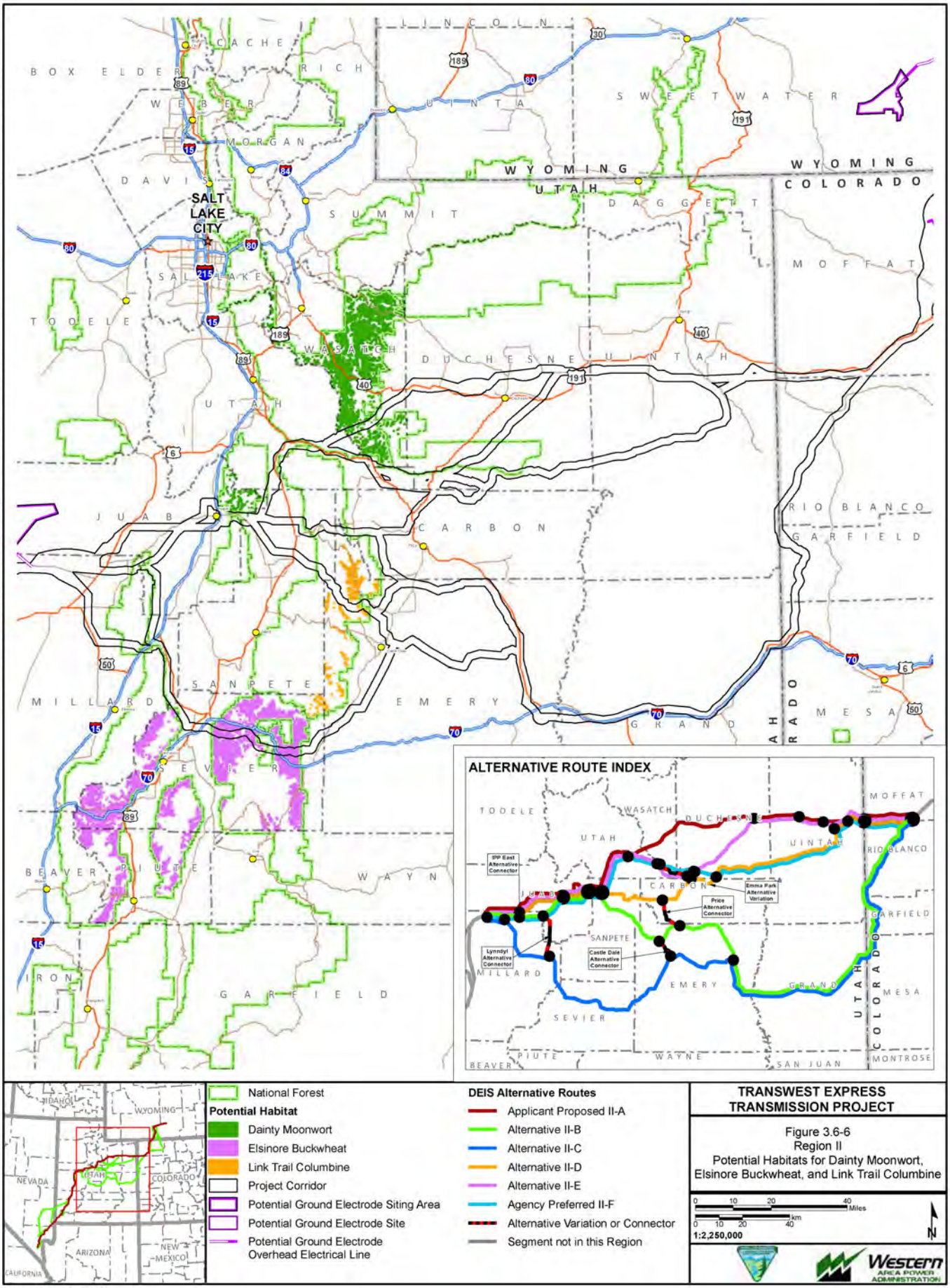
The Strawberry IRA and Cedar Creek Knoll IRA micro-siting options all have similar impacts to special status plant species as the comparable section of Alternative II-A.

Alternative II-B

Colorado Hookless Cactus (Federally Threatened)

Within the Alternative II-B 2-mile transmission line corridor, approximately 5,338 acres of potential habitat has been identified for the Colorado hookless cactus (**Table 3.6-11**, **Figure 3.6-5**). Based on species occurrence data and agency consultation, Colorado hookless cactus individuals or populations have been identified within the Alternative II-B corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative


SALT LAKE CITY
BOX ELDER
CACHE
RICH
WEBER
MORGAN
DAVIS
SALT LAKE
TOOELE
SUMMIT
WASATCH
DUCHESNE
UINTAH
UTAH
DAGGETT
SWEETWATER
LINCOLN
WYOMING
COLORADO
MOFFAT
RIO BLANCO
GARFIELD
MESA
GRAND
EMERY
CARBON
SANPETE
SEVIER
JUAB
MILLARD
BEAVER
PIUTE
WAYNE
IRON
ALTERNATIVE ROUTE INDEX
IPP East Alternative Connector
Emma Park Alternative Variation
Price Alternative Connector
Lynndyl Alternative Connector
Castle Dale Alternative Connector
SAN JUAN
MONTROSE
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
National Forest
Potential Habitat
Dainty Moonwort
Elsinore Buckwheat
Link Trail Columbine
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-6
Region II
Potential Habitats for Dainty Moonwort, Elsinore Buckwheat, and Link Trail Columbine
Miles
km
1:2,250,000
N
Western AREA POWER ADMINISTRATION
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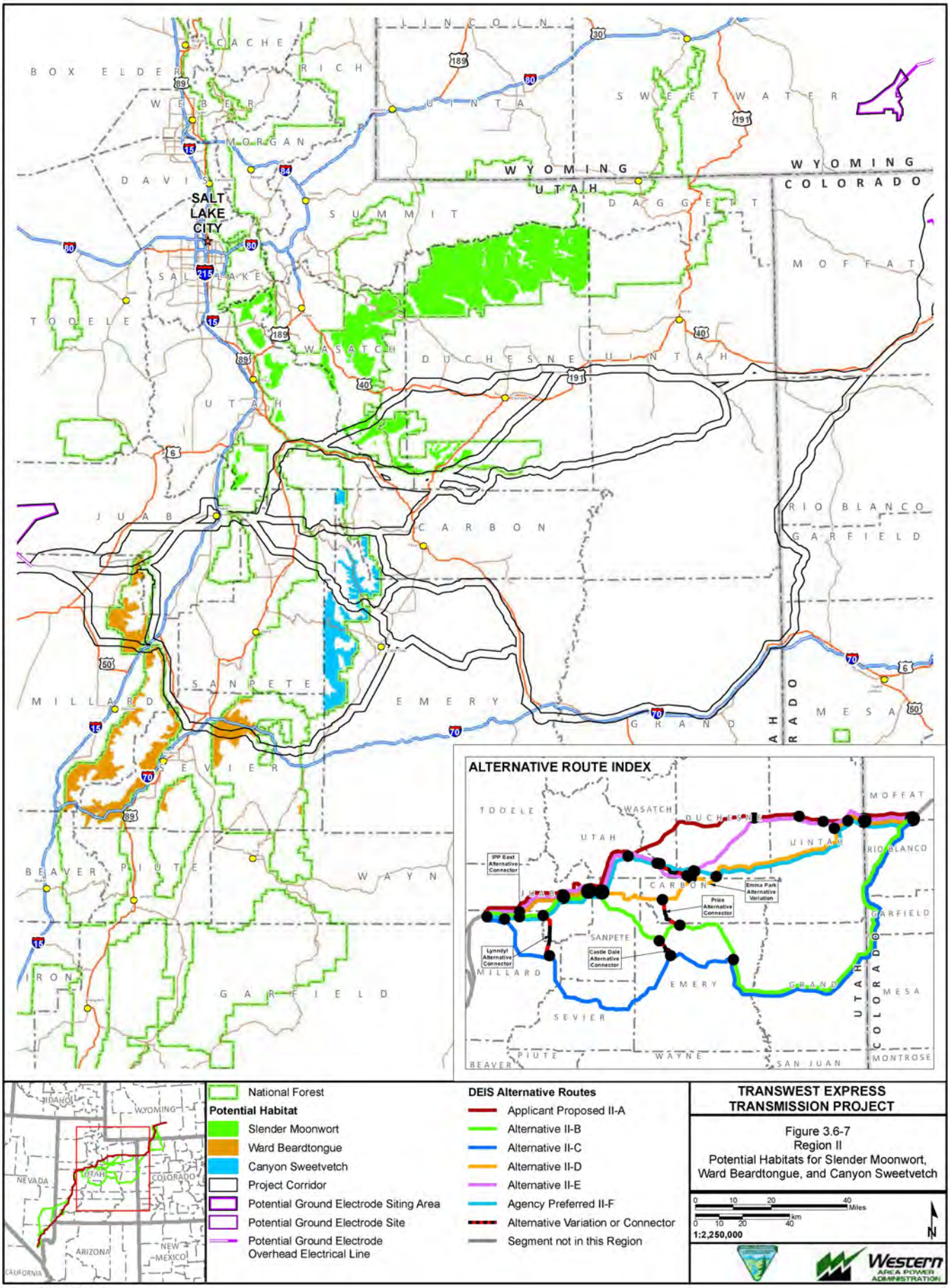

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-7
Region II
Potential Habitats for Slender Moonwort, Ward Beardtongue, and Canyon Sweetvetch

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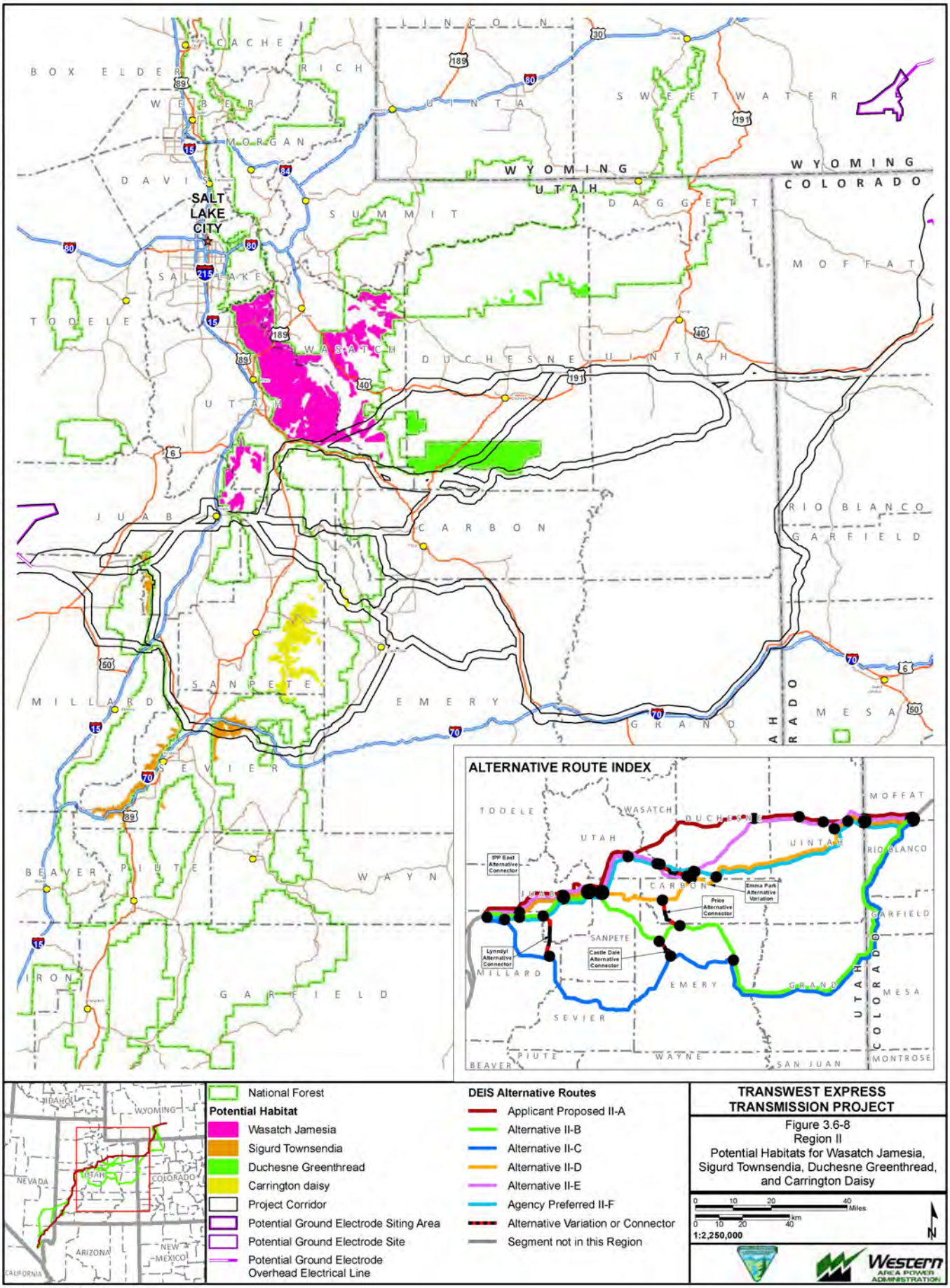
SALT LAKE CITY
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JUAB
CARBON
MILLARD
SANPETE
EMERY
SEVIER
BEAVER
PIUTE
WAYNE
IRON
GARFIELD
GRAND
LINCOLN
SWEETWATER
WYOMING
COLORADO
DAGGETT
MOFFAT
RIO BLANCO
GARFIELD
MESA
ALTERNATIVE ROUTE INDEX
TOOELE
WASATCH
DUCHESNE
MOFFAT
UTAH
UINTAH
RIO BLANCO
JUAB
CARBON
GARFIELD
SANPETE
MILLARD
EMERY
GRAND
MESA
SEVIER
BEAVER
PIUTE
WAYNE
SAN JUAN
MONTROSE
IPP East Alternative Connector
Emma Park Alternative Variation
Price Alternative Connector
Lynndyl Alternative Connector
Castle Dale Alternative Connector
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
National Forest
Potential Habitat
Wasatch Jamesia
Sigurd Townsendia
Duchesne Greenthread
Carrington daisy
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-8
Region II
Potential Habitats for Wasatch Jamesia, Sigurd Townsendia, Duchesne Greenthread, and Carrington Daisy
0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N
Western AREA POWER ADMINISTRATION
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Routes and Associated Components. Based on the substantial amount of potential habitat identified within the 2-mile transmission line corridor, and the occurrence of known locations in Alternative II-B, total avoidance of potential habitat for Colorado hookless cactus may not be feasible. To minimize impacts to Colorado hookless cactus habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of potential habitat for the species. In these areas, direct and indirect impacts to the species would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Federal Species Identified as having Potential Habitat

Within Alternative II-B, potential habitat was identified for the Graham's penstemon, Jones cycladenia, Last Chance townsendia, Ute ladies'-tresses orchid, Winkler cactus, White River beardtongue, and Wright fishhook cactus, as presented in **Table 3.6-11** and illustrated in **Figures 3.6-2**, **3.6-3**, **3.6-4**, and **3.6-5**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-B 2-mile transmission line corridor. No critical habitat has been designated for these species. Alternative II-B crosses the San Rafael Swell, which would be difficult to reclaim due to soil reclamation constraints, and low regional annual precipitation rates.

Potential habitat for the Graham's penstemon, Jones cycladenia, Last Chance townsendia, and Ute ladies'-tresses orchid each total less than 2,000 acres, and for some, less than 100 acres. Potential habitats for the Winkler cactus and White River beardtongue total approximately 5,320 and 3,058 acres, respectively, but are found in limited locations within the 2-mile transmission line corridor. Potential habitat for the Wright fishhook cactus extends over 40,000 acres within the 2-mile transmission line corridor.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the aforementioned species are not anticipated. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. If species are identified during site-specific surveys, impacts would be avoided as per mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Species-specific impact minimization and mitigation measures would be developed in consultation with the appropriate management agencies prior to construction.

To minimize and mitigate impacts to all potential habitats within the 2-mile transmission line corridors, WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented.

With implementation of mitigation measure **SS-4**, no impacts to Ute ladies'-tresses orchid habitat is anticipated. Based on the limited acreage of potential habitat identified within the 2-mile transmission line corridor for the Graham's penstemon, Jones cycladenia, and Last Chance townsendia, no impacts are anticipated for these species within Alternative II-B. As potential habitats for Winkler cactus and White River beardtongue are only found in isolated locations within the 2-mile transmission line corridor, no impacts are anticipated for these species within Alternative II-B. Given the contiguous spatial extent of potential habitat identified for the Wright fishhook cactus, complete avoidance may not be feasible. To minimize impacts to suitable habitat for the Wright fishhook cactus, mitigation measure **SS-10** would be applied. Reclamation in the habitats associated with the Wright fishhook cactus may be difficult and long-term due to the desert environment where the Wright fishhook is found. See Section 3.5,

Vegetation, for more detail on reclamation. Lack of reclamation success would result in greater loss of suitable habitat for this species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-B 2-mile-wide corridor: Neese narrowleaf penstemon, Cisco milkvetch, debris milkvetch, Duchesne milkvetch, Ferron milkvetch, giant fourwing saltbush, grand buckwheat, Jones' blue star, Jones indigo-bush, narrowstem gilia, Rollins' cryptantha, and Uinta Basin springparsley. Based on a desktop review, potential habitat has been identified for 36 BLM sensitive species within the Alternative II-B 2-mile transmission line corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Alternative II-B crosses the San Rafael Swell, which would be difficult to reclaim due to soil reclamation constraints, and low regional annual precipitation rates.

The BLM sensitive species with known locations and habitat within the corridors are predominantly found in desert shrublands, rocky, barren areas, sand dunes, and shrub and pinyon-juniper communities. Impacts to species in low reclamation habitats such as rocky barren areas, sand dunes, and desert shrublands would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the timeframe needed to restore woody communities.

The WWEC BMPs, design features, and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate potential impacts to BLM sensitive species habitat.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. In such cases, additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided through implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, one species, the Carrington daisy, has been identified within the Alternative II-B 2-mile transmission line corridor. Within Alternative II-B, potential habitat has been identified for the following USFS sensitive species: canyon sweetvetch, Carrington daisy, Link Trail columbine, Maguire campion, Nevada willowherb, Sigurd townsendia, and Ward beardtongue. The canyon sweetvetch, Carrington daisy, Link Trail columbine, and Maguire campion are protected in the USFS-Manti-La Sal National Forest. The Maguire campion also is listed in the Dixie and Fishlake national forests. The Nevada willowherb, Sigurd townsendia, and Ward beardtongue are listed in the Fishlake National Forest. Species ranges and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Potential habitats for these species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Carrington Daisy are located south of the analysis area within the Manti-La Sal National Forest. The known occurrence within the 2-mile transmission line corridors is also within the Manti-La Sal National Forest. Link Trail columbine, Nevada willowherb, and Sigurd townsendia, have less than 1,000 acres of potential habitat identified within the corridors. Link Trail

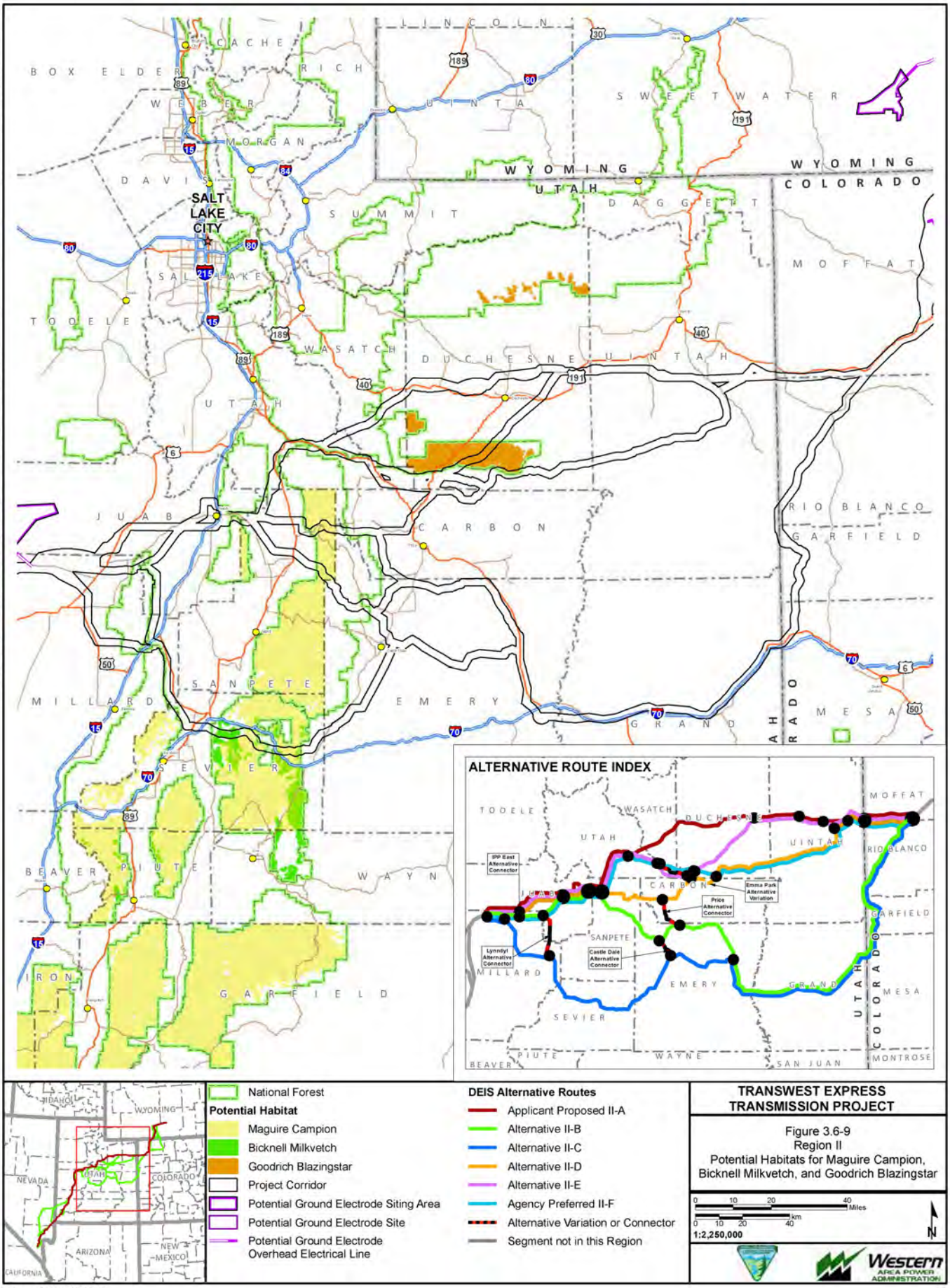

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Figure 3.6-9
Region II
Potential Habitats for Maguire Campion, Bicknell Milkvetch, and Goodrich Blazingstar

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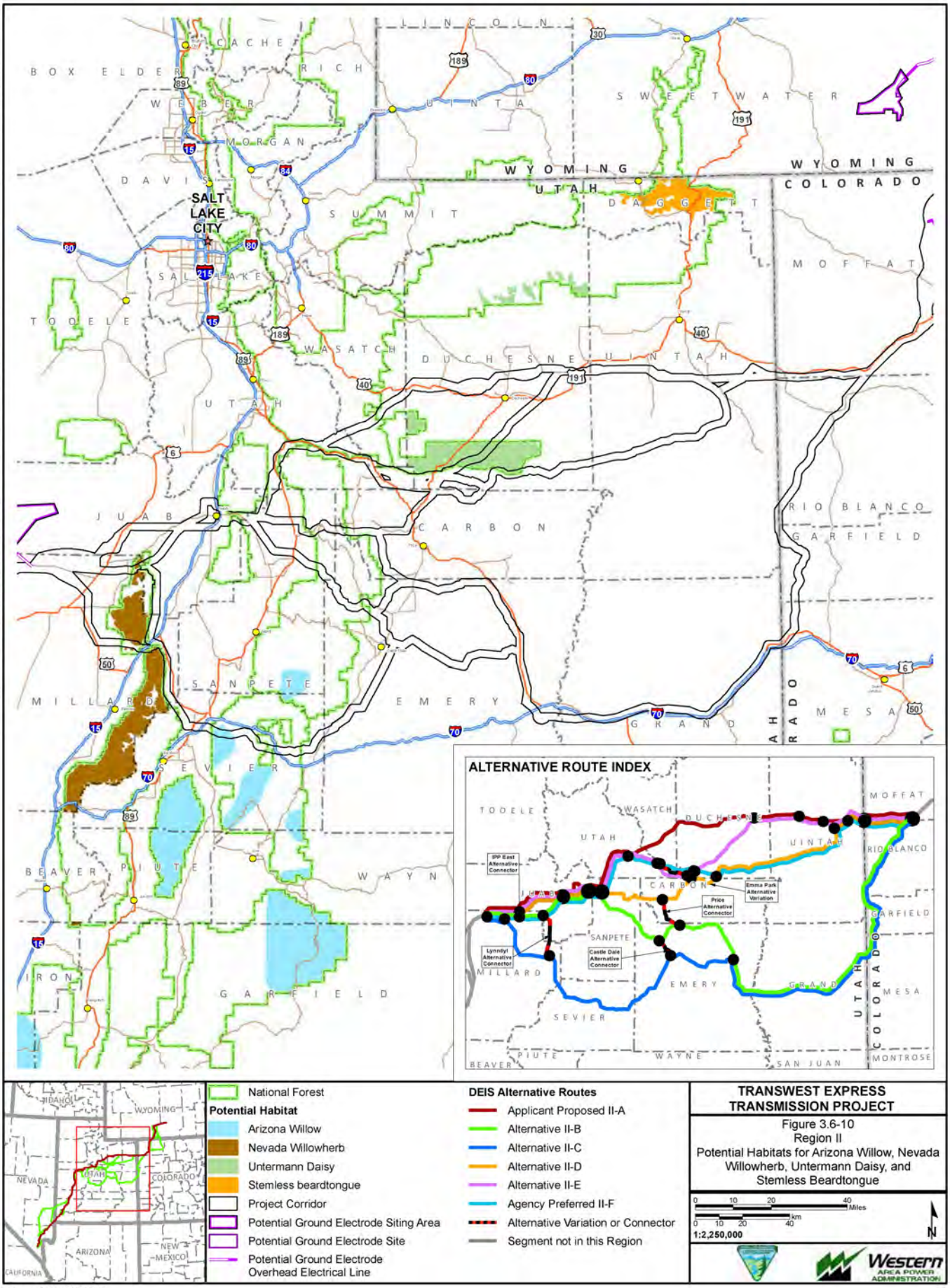
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LINCOLN
SWEETWATER
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
RIO BLANCO
GARFIELD
MESA
GRAND
EMERY
CARBON
JUAB
SANPETE
MILLARD
SEVIER
BEAVER
PIUTE
WAYNE
IRON
ALTERNATIVE ROUTE INDEX
IPP East Alternative Connector
Emma Park Alternative Variation
Price Alternative Connector
Lynndyl Alternative Connector
Castle Dale Alternative Connector
MONTROSE
SAN JUAN
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
National Forest
Potential Habitat
Arizona Willow
Nevada Willowherb
Untermann Daisy
Stemless beardtongue
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-10
Region II
Potential Habitats for Arizona Willow, Nevada Willowherb, Untermann Daisy, and Stemless Beardtongue
Miles
km
1:2,250,000
N
Western AREA POWER ADMINISTRATION
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columbine is found in the analysis area in Manti-La Sal and Fishlake National Forests. Nevada willowherb is located completely in the analysis area in Fishlake National Forest. Ward beardtongue has approximately 1,300 acres of fairly contiguous potential habitat. Sigurd townsendia and Ward beardtongue are found within and outside the analysis area in Fishlake National Forest. The canyon sweetvetch has approximately 1,400 acres of potential habitat located in small units within the 2-mile transmission line corridor. The majority of canyon sweetvetch occurrences are found outside of the analysis area. Within the 2-mile corridor of Alternative II-B, the Maguire campion has approximately 4,300 acres of fairly contiguous potential habitat. Although not within the 2-mile transmission line corridor, most of the known Maguire campion occurrences are found within the analysis area in the Manti-La Sal National Forest.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. For the species with limited and dispersed potential habitat (canyon sweetvetch, Carrington Daisy, Link Trail columbine, Nevada willowherb, and Sigurd townsendia), impacts to suitable habitats are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Maguire campion and Ward beardtongue), total avoidance of habitat may not be feasible. To minimize impacts to Maguire campion and Ward beardtongue suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts in these areas would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

<u>Alternative II-C</u>

Colorado Hookless Cactus (Federally Threatened)

As Alternative II-C coincides with Alternative II-B through Colorado hookless cactus habitat, the acreage and occurrence data for Colorado hookless cactus under Alternative II-C is the same as that described for Alternative II-B.

As Alternative II-C coincides with Alternative II-B in this area, impacts to Colorado hookless cactus would be the same under Alternative II-C as described above for Alternative II-B.

San Rafael Cactus (Federally Endangered)

Within Alternative II-C, there is approximately 868 acres of potential habitat for the San Rafael cactus (**Table 3.6-11**, **Figure 3.6-3**). Based on species occurrence data and agency consultation, San Rafael cactus individuals or populations have been identified within the Alternative II-C corridor. No critical habitat has been designated for this species.

WWEC BMPs, TWE's design features and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. Based on the limited acreage of potential habitat and limited number of known locations in the Alternative II-C corridor, no impacts are anticipated for this species and associated habitat.

Federally Listed Species Identified as having Potential Habitat

Within the Alternative II-C 2-mile transmission line corridor, there is potential habitat identified for Graham's penstemon, Jones cycladenia, Last Chance townsendia, Ute ladies'-tresses orchid, White River beardtongue (White River penstemon), Winkler cactus, and Wright fishhook cactus, as presented in **Table 3.6-11** and illustrated in **Figures 3.6-2**, **3.6-3**, **3.6-4**, and **3.6-5**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-C corridor. No critical habitat has been designated for these species. Habitat descriptions are similar to those described for Alternative II-B.

Based on the similar vegetation communities, list of federally listed species, and similar acres of potential habitat, impacts to federally listed species under Alternative II-C would be similar to those described above for Alternative II-B, except for Last Chance townsendia. Within Alternative II-C, 8,068 acres of fairly contiguous potential habitat for Last Chance townsendia falls within the 2-mile transmission line corridor.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. For the linear stretches of contiguous Last Chance townsendia habitat in the corridor, total avoidance of habitat may not be feasible. To minimize impacts to Last Chance townsendia suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts in these areas would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within Alternative II-C 2-mile-wide corridor: Neese narrowleaf penstemon, Cisco milkvetch, debris milkvetch, Duchesne milkvetch, Ferron milkvetch, Grand buckwheat, Jones' blue star, Jones indigo-bush, loa milkvetch, Maguire daisy, narrowstem gilia, Pioche blazingstar, Rollins cryptantha, Sigurd townsendia, Uinta Basin springparsely, Utah phacelia, and Ward beardtongue. Based on a desktop review, potential habitat has been identified for 43 BLM sensitive species within the Alternative II-C corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. The BLM sensitive species with known locations and habitat within the corridors range from species that are found across a wide variety of habitats to those that are only found

on very specific soil and vegetation combinations. The habitats in this alternative are composed predominantly of various sandy, rocky, gravelly, and volcanic substrates that are located on outcrops, barren areas, desert, or in shrub and woodland communities such as pinyon-juniper and sagebrush communities, and desert shrublands. A few species are located in riparian and wet areas. Impacts to species in habitats with low reclamation potential such as sandy soils, cliffs, deserts, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame to restore woody communities.

The BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitats. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species or habitat avoidance of BLM sensitive species is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, two species, Sigurd townsendia and Ward beardtongue have been identified within the Alternative II-C 2-mile transmission line corridor. Based on a desktop review, potential habitat has been identified for the following USFS sensitive species within this corridor: Arizona willow, Bicknell milkvetch, Elsinore buckwheat, Maguire campion, Nevada willowherb, Sigurd townsendia, and Ward beardtongue. All the species are listed in the Fishlake National Forest; Arizona willow and Maguire campion are also listed in Dixie and Manti-La Sal national forests. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Potential habitats for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

Potential habitat for Sigurd townsendia totals 4,520 acres of scattered habitat within Fishlake National Forest. Two of the areas identified as potential habitat are fairly long contiguous sections. The species is found in several locations within the analysis area and the 2-mile transmission line corridor associated with this alternative. Sigurd townsendia is found within and outside the analysis area in Fishlake National Forest. Potential habitat for the Ward beardtongue totals approximately 20,825 acres of fairly contiguous habitat within the Fishlake National Forest. Known occurrences for Ward beardtongue are found within and outside the analysis area in Fishlake National Forest.

Potential habitat for Arizona willow covers a large portion of the corridor where it crosses the Fishlake National Forest. Arizona willow is located within the analysis area in Manti-La Sal National Forest. Potential habitat for Bicknell milkvetch is located in the 2-mile transmission line corridor in the Fishlake National Forest. The potential habitat is scattered within the corridor. The majority of known occurrences of Bicknell milkvetch are located predominantly outside the analysis area. Potential habitat for Elsinore buckwheat is located in Fishlake National Forest and is found in scattered locations within the corridor, with some sections that are fairly contiguous. Documented Elsinore buckwheat occurrences are located predominantly outside the analysis area. Potential habitat for Maguire campion totals approximately, 3,700 acres and is scattered within the 2-mile transmission line corridors in Alternative II-C. The majority of the Maguire campion occurrences are found within the analysis area within Manti-La Sal National Forest. Potential habitat for Nevada willowherb totals approximately 2,100 acres of potential habitat

identified within the Alternative II-C 2-mile transmission line corridor. The species is located completely in the analysis area in Fishlake National Forest.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitats. Species-specific surveys within suitable habitats, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Impacts are not anticipated for the species with limited and dispersed potential habitat (Bicknell milkvetch, Maguire campion, and Nevada willowherb). For the species with linear stretches of contiguous habitat paralleling the corridors (Arizona willow, Elsinore buckwheat, Sigurd townsendia, and Ward beardtongue), total avoidance of habitat may not be feasible. To minimize impacts to suitable habitats for Arizona willow, Elsinore buckwheat, Sigurd townsendia, and Ward beardtongue, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Alternative II-D

Clay Reed-Mustard (Federally Threatened)

Within Alternative II-D 2-mile corridor, there is approximately 3,607 acres of potential habitat for the clay reed-mustard (**Table 3.6-11**, **Figure 3.6-3**). Based on species occurrence data and agency consultation, clay reed-mustard individuals or populations have been identified within the Alternative II-D corridors. No critical habitat has been designated for this species.

BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. TWE's applicant-committed protection measures ECO-1 and ECO-4 indicate suitable habitat avoidance as the primary consideration during Project design and implementation. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the limited number of known clay reed-mustard locations in the 2-mile transmission line corridor for Alternative II-D, no direct impacts to this species are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat with the corridor. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied.

Graham's Penstemon

Within Alternative II-D, there is approximately 9,077 acres of potential habitat for the Graham's penstemon (**Table 3.6-11**, **Figure 3.6-5**). Based on species occurrence data and agency consultation, Graham's penstemon individuals or populations have been identified within the corridors within Alternative II-D 2-mile transmission line corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the limited number of known locations in the 2-mile transmission line corridors for Alternative II-D, no direct impacts to the Graham's penstemon are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat with the 2-mile transmission line corridors. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Uinta Basin Hookless Cactus

Within Alternative II-D, there is approximately 54,839 acres of potential habitat for the Uinta Basin hookless cactus as presented in **Table 3.6-11** and illustrated in **Figure 3.6-4**. Based on species occurrence data and agency consultation, Uinta Basin hookless cactus individuals or populations have been identified within the corridors within Alternative II-D 2-mile transmission line corridor. Alternative II-D crosses Uinta Basin hookless cactus Level 1 and Level 2 core conservation areas. Disturbance in a Level 1 core conservation area may require formal consultation with the USFWS. No critical habitat has been designated for this species. Any surface disturbance within 300 feet of Uinta Basin hookless cactus would require formal consultation with the USFWS.

Based on the extent of the potential habitat, and known locations within the 2-mile corridor, total avoidance of this species and its habitat is unlikely. If avoidance is not feasible, impacts to the Uinta Basin hookless cactus would be the same as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Specific impacts of concern to the Uinta Basin hookless cactus include potential increases in illegal collection of the Uinta Basin hookless cactus, habitat fragmentation, the introduction and spread of invasive species, the loss of pollinators, fugitive dust impacts, and increased sedimentation. Reclamation in the habitats associated Uinta Basin hookless cactus may be difficult due to poor soils, invasive and noxious weeds, and low precipitation. See Section 3.5, Vegetation, for more detail on reclamation.

To mitigate Project-related impacts to Uinta Basin hookless cactus, the following mitigation measure is proposed:

SS-11: *(Uinta Basin Hookless Cactus Core Conservation Area Mitigation Measures) – Construction within Uinta Basin Hookless Cactus Level 1 and Level 2 Core Conservation areas will follow the Draft Energy Development Management Guidelines for Sclerocactus wetlandicus and Sclerocactus brevispinus Core Conservation Areas as appropriate. These include limited to no surface disturbance in core conservation areas and having an on-site botanist during construction activities. If these measures are not implemented, mitigation measures will need to be developed in consultation with the BLM and USFWS.*

Effectiveness: Implementation of mitigation measure **SS-10**, in addition to WWEC BMPs, TWE's design features and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would minimize direct and indirect impacts to the Uinta Basin hookless cactus within the Core Conservation Areas. Based on the large number of known locations and large amount of potential habitat in the 2-mile transmission line corridor for Alternative II-D, total avoidance of known locations and

potential habitat for this species is unlikely. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. To minimize impacts to Core Conservation Areas, mitigation measure **SS-11**, would be applied. If the Level 1 Core Conservation Areas cannot be avoided, it could result in a loss of individuals and suitable habitat and formal consultation with the USFWS would be required. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Federal Species Identified as having Potential Habitat

Within Alternative II-D, potential habitat was modeled for the shrubby reed-mustard, Ute ladies'-tresses orchid, and White River beardtongue (**Table 3.6-11** and **Figures 3.6-2**, **3.6-3**, and **3.6-4**). Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-D corridor. No critical habitat has been designated for these species.

Modeled potentially suitable habitat for shrubby reed-mustard within the Alternative II-D corridor totals around 108 acres. Potential habitat for White River beardtongue totals less than 500 acres and modeled habitat for Ute ladies'-tresses orchid totals around 1,170 acres.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the aforementioned species are not anticipated. If species are identified during species-specific surveys, species avoidance would be conducted based on mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, and impact minimization and mitigation measures would be developed in consultation with the USFS, and Western prior to construction.

To minimize and mitigate impacts to all potential habitats within the 2-mile transmission line corridor, the WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**.

Based on the limited acreage of potential habitat that has been modeled in the 2-mile transmission corridor for shrubby reed-mustard, no impacts are anticipated for shrubby reed-mustard under Alternative II-D.

Given the small amount of potential habitat for White River beardtongue, no impacts are anticipated for this species within Alternative II-D. Reclamation in the habitats associated with clay reed-mustard, Uinta Basin Hookless Cactus, and shrubby reed-mustard may be difficult due to soils with low reclamation potential, invasive and noxious weeds, and low precipitation. See Section 3.5, Vegetation, for more detail on reclamation. With implementation of mitigation measure **SS-4**, no impacts to Ute ladies'-tresses orchid habitat is anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-D 2-mile-wide corridor: Barneby's catseye, Neese narrowleaf penstemon, debris milkvetch, Duchesne greenthread, giant fourwing saltbush, Goodrich blazingstar, Graham's penstemon, horseshoe milkvetch, and narrowstem gilia. Based on a desktop review, potential habitat has been identified for 32 BLM sensitive species within the Alternative II-D corridor. Associated ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the BLM sensitive species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The BLM sensitive species with known locations and habitat within the corridors range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include dunes, clay substrates, ridge tops, barren, sparsely, vegetated areas; shrub and juniper communities, coniferous communities, chaparral, mountain, and mixed and desert shrublands. Two species do not have available habitat information: the cushion milkvetch and strigose Easter daisy. A conservative analysis was applied for these species and they were carried forward for detailed analysis. Impacts to species in habitats with low reclamation potential such as rocky ridgetops, sandy soils, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame needed to restore woody communities. The WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat.

USFS Sensitive Species

Based on species occurrence data and agency consultation, Duchesne greenthread and Goodrich blazingstar have been identified within the Alternative II-D corridor. Within this corridor, potential habitat has been identified for the following USFS sensitive species: canyon sweetvetch, dainty moonwort, Duchesne greenthread, Goodrich blazingstar, Maguire campion, Untermann daisy, and Wasatch jamesia. Canyon sweetvetch and Maguire campion are listed as sensitive in the Manti-La Sal National Forest. Maguire campion also is listed in the Dixie and Fishlake national forests. Dainty moonwort, Duchesne greenthread, Goodrich blazingstar, and Untermann daisy are listed as sensitive in the Ashley National Forest. Dainty moonwort is also listed in the Uinta-Wasatch-Cache National Forest along with the Wasatch jamesia. Associated species ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Potential habitats for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Duchesne greenthread and Goodrich blazingstar are located almost entirely in the analysis area within the Ashley National Forest. The known occurrences for both species within the Alternative II-D corridor also are within the Ashley National Forest and potential habitats for both are quite extensive.

Canyon sweetvetch, dainty moonwort, and Wasatch jamesia each have less than 5 acres of potential habitat identified within this corridor. All known occurrences of these three species are located outside of the 2-mile transmission line corridor and, for the most part, outside of the analysis area. Maguire campion has approximately 6,500 acres of fairly contiguous potential habitat within the 2-mile transmission line corridor of Alternative II-D. The majority of the Maguire campion occurrences found within the analysis area are within the Manti-La Sal National Forest. Untermann daisy is located within Ashley National Forest in the analysis area, and the potential habitat for this species covers a large portion of the Alternative II-D route where it crosses Ashley National Forest.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible,

impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, and TWE's design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**.

For the species with limited and dispersed potential habitat (canyon sweetvetch, dainty moonwort, and Wasatch jamesia), impacts are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Duchesne greenthread, Goodrich blazingstar, Maguire campion, and Untermann daisy), complete avoidance of habitat is not likely. To minimize impacts to suitable habitats for these species, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Alternative II-E

Clay Phacelia

Within Alternative II-E, there are approximately 2,645 acres of potential habitat for the clay phacelia (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency consultation, clay phacelia individuals or populations have been identified within the Alternative II-E corridor. No critical habitat has been designated for this species. Impacts to the species would be the similar as described for Alternative II-A.

As Alternative II-E coincides with Alternative II-A in this area, potential Project-related impacts to clay phacelia would be the same as those described above for Alternative II-A.

Deseret Milkvetch

As Alternative II-E coincides with Alternative II-A through this species' range, the acreage and occurrence data for Deseret milkvetch are the same as those described for Alternative II-A. Potential Project-related impacts to Deseret milkvetch would be the same as those described above for Alternative II-A.

Graham's Penstemon

Within Alternative II-E, there are approximately 15,080 acres of potential habitat for the Graham's penstemon (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency consultation, Graham's penstemon individuals or populations have been identified within the Alternative II-E corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species

avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the limited number of known locations in the Alternative II-E corridor, no direct impacts to Graham's penstemon are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat within the 2-mile-wide corridors. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Ute Ladies'-tresses Orchid

Within Alternative II-E, there are approximately 3,900 acres of potential habitat for the Ute ladies'-tresses orchid as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, Ute ladies'-tresses orchid individuals or populations have been identified within the Alternative II-E corridor. No critical habitat has been designated for this species.

BMPs, design features, and mitigation measures and effects would be similar to those presented for the Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to the Ute ladies'-tresses orchid and its associated habitat are anticipated.

Federal Species Identified as having Potential Habitat

Within Alternative II-E, there is potential habitat identified for White River beardtongue, as presented in **Table 3.6-11** and illustrated in **Figure 3.6-4**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-E corridor. No critical habitat has been designated for these species.

Approximately 343 acres of potential habitat for White River beardtongue has been identified within the 2-mile transmission line corridor.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the small amount of potential habitat for White River beardtongue, impacts associated with Alternative II-E are not anticipated for this species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-E 2-mile transmission line corridor: Argyle Canyon phacelia, Barneby's catseye, Neese narrowleaf penstemon, debris milkvetch, giant fourwing saltbush, Goodrich blazingstar, Graham's penstemon, horseshoe milkvetch, narrowstem gilia, Untermann daisy, and Utah columbine. Based on a desktop review, potential habitat has been identified for 32 BLM sensitive species within the Alternative II-A corridor. Associated species range and habitat are provided in **Appendix G, Table G-1**.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and

Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that can be avoided based on the implementation of the WWEC BMPs, TWE's design features and proposed mitigation, direct and indirect impacts are not anticipated.

The BLM sensitive species with known locations and habitat within the Alternative II-E corridor range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include sandy and clay substrates, ridge tops, badlands, steep slopes, barren, and sparsely vegetated areas; shrub and juniper communities, coniferous communities, chaparral, mountain, and mixed and desert shrublands. Two species do not have available habitat information: the cushion milkvetch and strigose Easter daisy. A conservative analysis was applied for these species and they were carried forward for detailed analysis. Impacts to species in habitats with low reclamation potential such as rocky ridgetops, sandy soils, and barren or sparsely vegetated areas would greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame needed to restore woody communities.

The BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species or habitat avoidance is not infeasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. In such cases, impact minimization and additional mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, Goodrich blazingstar and Untermann daisy have been identified within the Alternative II-E 2-mile transmission line corridor. Within this corridor, potential habitat has been identified for the following USFS sensitive species: dainty moonwort, Duchesne greenthread, Goodrich blazingstar, slender moonwort, Untermann daisy, and Wasatch jamesia. The dainty moonwort, Duchesne greenthread, Goodrich blazingstar, and Untermann daisy are listed in the Ashley National Forest. Dainty moonwort is also listed in the Uinta-Wasatch-Cache National Forest along with the Wasatch jamesia. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Potential habitat for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Goodrich blazingstar (Goodrich stickleaf) and Untermann daisy are located almost entirely in the analysis area within the Ashley National Forest. The known occurrences for both species within the 2-mile transmission line corridor are also within the Ashley National Forest and potential habitats for both are quite extensive. Dainty moonwort has only three acres of potential habitat identified within the corridors. Within the analysis area, dainty moonwort is found in wet, marshy, and spring areas around 8,000 feet. The majority of the known occurrences for Duchesne greenthread are located almost entirely in the analysis area within the Ashley National Forest. For Duchesne greenthread, there is approximately 9,500 acres of potential habitat that is extensive in the Alternative II-E 2-mile corridors within the Ashley National Forest. Slender moonwort has 152 acres of potential habitat within the Ashley National Forest. Within the analysis area, slender moonwort is

found above 9,000 feet in riparian and wet areas. Wasatch jamesia has 343 acres of potential habitat identified in the Uinta National Forest. The species occurrences for Wasatch jamesia are located outside of the analysis area.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, and TWE's design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The WWEC BMPs, and TWE's design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitats. Species-specific surveys within suitable habitats, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. For the species with limited and dispersed potential habitat (dainty moonwort, slender moonwort, and Wasatch jamesia), impacts are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Duchesne greenthread, Goodrich blazingstar, and Untermann daisy), total avoidance of habitat is not likely. To minimize impacts to Duchesne greenthread, Goodrich blazingstar, Maguire campion, and Untermann daisy suitable habitats, mitigation measure **SS-10** would be applied. For the areas that cannot be avoided, there would be a loss of suitable habitat for the species. For these species, impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Alternative II-F (Agency Preferred)

Clay Phacelia

Within Alternative II-F 2-mile corridor, there are approximately 2,645 acres of potential habitat for the clay phacelia (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency consultation, clay phacelia individuals or populations have been identified within the Alternative II-F corridor. No critical habitat has been designated for this species. Impacts to the species would be similar as those described for Alternative II-A.

As Alternative II-F coincides with Alternative II-E in this area, potential Project-related impacts to clay phacelia would be the same as those described above for Alternative II-E.

Desert Milkvetch

As Alternative II-F coincides with Alternative II-A through this species' range, the acreage and occurrence data for Deseret milkvetch are the same as those described for Alternative II-A. Potential Project-related impacts to Deseret milkvetch would be the same as those described above for Alternative II-A.

Graham's Penstemon

Within Alternative II-F, there are approximately 18,622 acres of potential habitat for the Graham's penstemon (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency

consultation, Graham's penstemon individuals or populations have been identified within the Alternative II-F corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (Appendix C), and proposed mitigation **SS-5** and **SS-6**. Based on the limited number of known locations in the Alternative II-F corridor, no direct impacts to Graham's penstemon are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat within the 2-mile wide corridors. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Clay Reed-mustard

As Alternative II-F coincides with Alternative II-D through this species' range, the acreage and occurrence data for the clay reed-mustard are the same as those described for Alternative II-D. Potential Project-related impacts to the clay reed-mustard would be the same as those described above for Alternative II-D.

Uinta Basin Hookless Cactus

As Alternative II-F coincides with Alternative II-D through this species' range, the acreage and occurrence data for the Uinta Basin hookless cactus are the same as those described for Alternative II-D. Potential Project-related impacts to the Uinta Basin hookless cactus would be the same as those described above for Alternative II-D.

Federal Species Identified as having Potential Habitat

Within Alternative II-F 2-mile corridor, there is potential habitat identified for shrubby reed-mustard, Ute ladies'-tresses orchid, and White River beardtongue, as presented in **Table 3.6-11** and illustrated in **Figures 3.6-2**, **3.6-3**, and **3.6-4**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-F corridor. No critical habitat has been designated for these species.

Approximately 108 acres of potential habitat for shrubby reed-mustard; 2,228 acres of potential habitat for Ute ladies'-tresses orchid; and 400 acres of potential habitat for the White River beardtongue were identified within the 2-mile transmission line corridor.

WWEC BMPs, TWE's design features and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**.

BMP's design features, mitigation measures, and their effects would be similar to those presented for Alternative I-A conclusion; therefore, no impacts to Ute ladies'-tresses orchid and its habitat are anticipated. Reclamation in the habitats associated with shrubby reed-mustard may be difficult due to low reclamation soils, invasive and noxious weeds, and low precipitation. See Section 3.5, Vegetation,

for more detail on reclamation. Based on the small amount of potential habitat for White River beardtongue and shrubby reed-mustard, impacts associated with Alternative II-F are not anticipated for these species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-F corridor: debris milkvetch, narrowstem gilia, Argyle Canyon phacelia, Barneby's catseye, Neese narrowleaf penstemon, giant fourwing saltbush, Goodrich blazingstar, Graham's penstemon, horseshoe milkvetch, and Duchesne greenthread. Based on a desktop review, potential habitat has been identified for 34 BLM sensitive species within the Alternative II-F corridor. Associated species range and habitat are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative II-F corridor range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include sandy and clay substrates, ridge tops, badlands, steep slopes, barren, and sparsely vegetated areas; shrub and juniper communities, coniferous communities, chaparral, mountain, and mixed and desert shrublands. Impacts to species in habitats with low reclamation potential such as rocky ridgetops, sandy soils, and barren or sparsely vegetated areas, would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame needed to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that can be avoided based on the implementation of the WWEC BMPs, TWE's design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, the Goodrich blazingstar and Duchesne greenthread have been identified within the Alternative II-F 2-mile transmission line corridor. Within this corridor, potential habitat has been identified for the following nine USFS sensitive species: Nevada willowherb, dainty moonwort, slender moonwort, Duchesne greenthread, Goodrich blazingstar, Untermann daisy, Wasatch jamesia, Ward beardtongue, and Sigurd townsendia. The dainty moonwort, Duchesne greenthread, Goodrich blazingstar, and Untermann daisy are listed as sensitive in the Ashley National Forest. Dainty moonwort also is listed as sensitive in the Uinta-Wasatch-Cache National Forest along with the Wasatch jamesia. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Potential habitat for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Goodrich blazingstar (Goodrich stickleaf) and Untermann daisy are located almost entirely in the analysis area within the Ashley National Forest. The known occurrences for both species within the 2-mile transmission line corridor also are within the Ashley National Forest and potential habitats for both species are quite extensive. Dainty moonwort has only 7 acres of potential habitat identified within the corridors. Within the analysis area, dainty moonwort is

found in wet, marshy, and spring areas around 8,000 feet amsl. The majority of the known occurrences for Duchesne greenthread are located almost entirely in the analysis area within the Ashley National Forest. For Duchesne greenthread, there is approximately 3,500 acres of potential habitat in the Alternative II-F 2-mile corridor within the Ashley and Uinta national forests. Slender moonwort has 608 acres of potential habitat within the Ashley National Forest. Within the analysis area, slender moonwort is found above 9,000 feet in riparian and wet areas. Wasatch jamesia has 343 acres of potential habitat identified in the Uinta National Forest. The species occurrences for Wasatch jamesia are located outside of the analysis area. Ward beardtongue has approximately 1,300 acres of fairly contiguous potential habitat in the 2-mile corridor.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation measures **SS-5** and **SS-6**. For the species with limited and dispersed potential habitat (dainty moonwort, slender moonwort, Nevada willowherb, Sigurd townsendia, and Wasatch jamesia), impacts are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Duchesne greenthread, Untermann daisy, and Ward beardtongue), total avoidance of habitat is not likely. To minimize impacts to Duchesne greenthread, Untermann daisy, and Ward beardtongue suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Along Alternative II-A, three micro-siting options exist in the area of the Strawberry IRA. There are three Federal Species identified as having potential habitat in the micro-siting area, including Barneby ridecress, clay phacelia, and Ute ladies'-tresses orchid. The micro-siting options do not differ from each other or the comparable portion of Alternative II-A in their effects on the three Federal Species' potential habitat. There are also three USFS Sensitive Species identified as having potential habitat in the micro-siting area, including dainty moonwort, slender moonwort, and Wasatch jamesia. The micro-siting options do not differ from each other or the comparable portion of Alternative II-A in their effects on the three USFS Sensitive Species' potential habitat.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation would reduce impacts on special status species potential habitat compared to Alternative II-F. The Emma Park Alternative Variation would avoid the portions of Alternative II-F that run along the Ashley and Uinta National Forests, therefore completely avoiding potential habitat for five USFS Sensitive Species, including Duchesne greenthread, Goodrich blazingstar, dainty moonwort, slender moonwort, and Untermann daisy, while reducing the acreage impacted for Wasatch jamesia from 77 acres to 18 acres. The Emma Park Alternative Variation would also completely avoid potential habitat for the Federally Listed Graham's penstemon, which intersects 9,545 acres of Alternative II-F.

Alternative Connectors in Region II

Table 3.6-12 summarizes the impacts and advantages/disadvantages associated with the four alternative connectors in Region II based on known occurrences and potential habitat identification within the 2-mile transmission line corridors.

Table 3.6-12 Summary of Region II Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Advantage
Highway 191 Alternative Connector	No known populations or potential habitat for special status plant species.	The advantage of using this alternative connector would include avoidance of special status plant species.
Price Alternative Connector	Potential habitat for two federally listed species (i.e., Wright fishhook cactus [approx. 13 acres] and Last Chance townsendia [approximately 12 acres]) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to two federally listed species.
Castle Dale Alternative Connector	Potential habitat for two federally listed species (i.e., Wright fishhook cactus [approx. 1,450 acres] and Last Chance townsendia [approximately 32 acres]) and seven BLM sensitive species (Creutzfeldt flower, entrada rushpink, Horse Canyon stickleaf, trotter oreoxis, Jones indigo-bush, psoralea globemallow, and Thompson talinum) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to two federally listed species and seven BLM sensitive species.
Lynndyl Alternative Connector	Potential habitat for one federally listed species (i.e., Ute ladies'-tresses orchid [approximately 1 acre]; three USFS sensitive species (i.e., Nevada willowherb [approximately 194 acres], Ward beardtongue [approximately 885 acres], Sigurd townsendia [approximately 344 acres]), and seven BLM sensitive species (*Arabis goodrichii,* Nevada willowherb, giant saltbush, ibex buckwheat, Neese narrowleaf penstemon, Ward beardtongue, and Sigurd townsendia) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to one federally listed species, three USFS sensitive species, and seven BLM sensitive species.
IPP East Alternative Connector	Known populations of the giant fourwing saltbush (BLM sensitive species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. Potential habitat for four BLM sensitive species (*Arabis goodrichii,* giant saltbush, ibex buckwheat, Neese narrowleaf penstemon) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species and potential habitat disturbance to four BLM sensitive species.

Region II Conclusion

The only known population of Deseret milkvetch is located along the 2-mile corridors for Alternatives II-A, II-E, and II-F. Implementation of **SS-8** would avoid impacts to Deseret milkvetch within the ROW. Indirect impacts to the species could potentially result from fugitive dust and noxious weed impacts. Within the Alternatives II-A, II-E, and II-F 2-mile corridors are located the majority of the known occurrences of clay phacelia. Based on the current reference line, the known locations for the species would be avoided; however, species could be impacted by erosion from construction activities based on its proximity between the main highway and the potential locations for the proposed transmission line. Direct impacts to clay phacelia could occur, especially if another second transmission line is located within the corridor. Predominately, indirect impacts to the species could predominantly result from erosion and sedimentation. Implementation of **SS-5** and **SS-10** would mitigate impacts to the species

through avoidance of known populations of high quality habitat and the implementation of stringent erosion controls.

Within Region II, Alternative II-F has the highest number of known occurrences of federally listed species, while the number of federally listed species with potential habitat is greatest in Alternative II-D and Alternative II-F impact the greatest acreage of potential habitat for federally listed species. Alternative II-C impacts the greatest number of BLM species. Alternative II-A impacts the least number of USFS species and potential habitat.

For species in along Alternatives II-B and II-C, within the San Rafael Swell, reclamation would be difficult and impacts potentially long-term based on the desert environment and poor soils characteristics of the San Rafael Swell.

3.6.6.5 Region III

Table 3.6-13 provides a comparison of impact parameters associated with the alternative routes in Region III based on known occurrences and potential habitat identified within the 2-mile transmission line corridors for special status plant species. Based on species occurrence information and habitat associations, 51 special status plant species may be impacted by the Project in Region III including 46 BLM sensitive species, 2 Forest sensitive species, 5 Nevada state listed species, and 4 federally listed species. To determine the location and spatial extent of potentially suitable habitat for federally listed species within the 2-mile transmission line corridors, a habitat assessment was conducted using ArcGIS and best available GIS datasets based on the habitat characteristics associated with individual species. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan under development. Species occurrence and associated habitats in Region III are provided in **Appendix G**, **Table G-1**.

Table 3.6-13 Summary of Region III Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Federally Listed Species			
Number of species with known occurrences impacted	1	1	1
Number of species with potential habitat impacted	3	2	2
Acreage of critical habitat impacted	--	--	--
Acreage of Las Vegas Buckwheat potential habitat impacted	11,591	4,442	7,088
Acreage of Shivwitz Milkvetch potential habitat impacted	195	0	0
Acreage of Siler Pincushion Cactus potential habitat impacted	2,904	0	0
Acreage of Ute ladies'-tresses orchid potential habitat impacted	0	18	977
BLM Sensitive Species			
Number of species with known occurrences impacted	9	9	7
Number of species with potential habitat impacted	31	38	38
USFS Sensitive Species			
Number of species with known occurrences impacted	1	0	0
Number of species with potential habitat impacted	2	0	0
Acreage of Pinyon Penstemon potential habitat impacted	15,573	0	0
Nevada State Listed Species			
Number of species with known occurrences impacted	3	3	1
Number of species with potential habitat impacted	4	6	6

Alternative III-A (Applicant Proposed)

Las Vegas Buckwheat (Federal Candidate)

Within Alternative III-A, there is approximately 11,591 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-13** and illustrated in **Figure 3.6-11**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative III-A corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

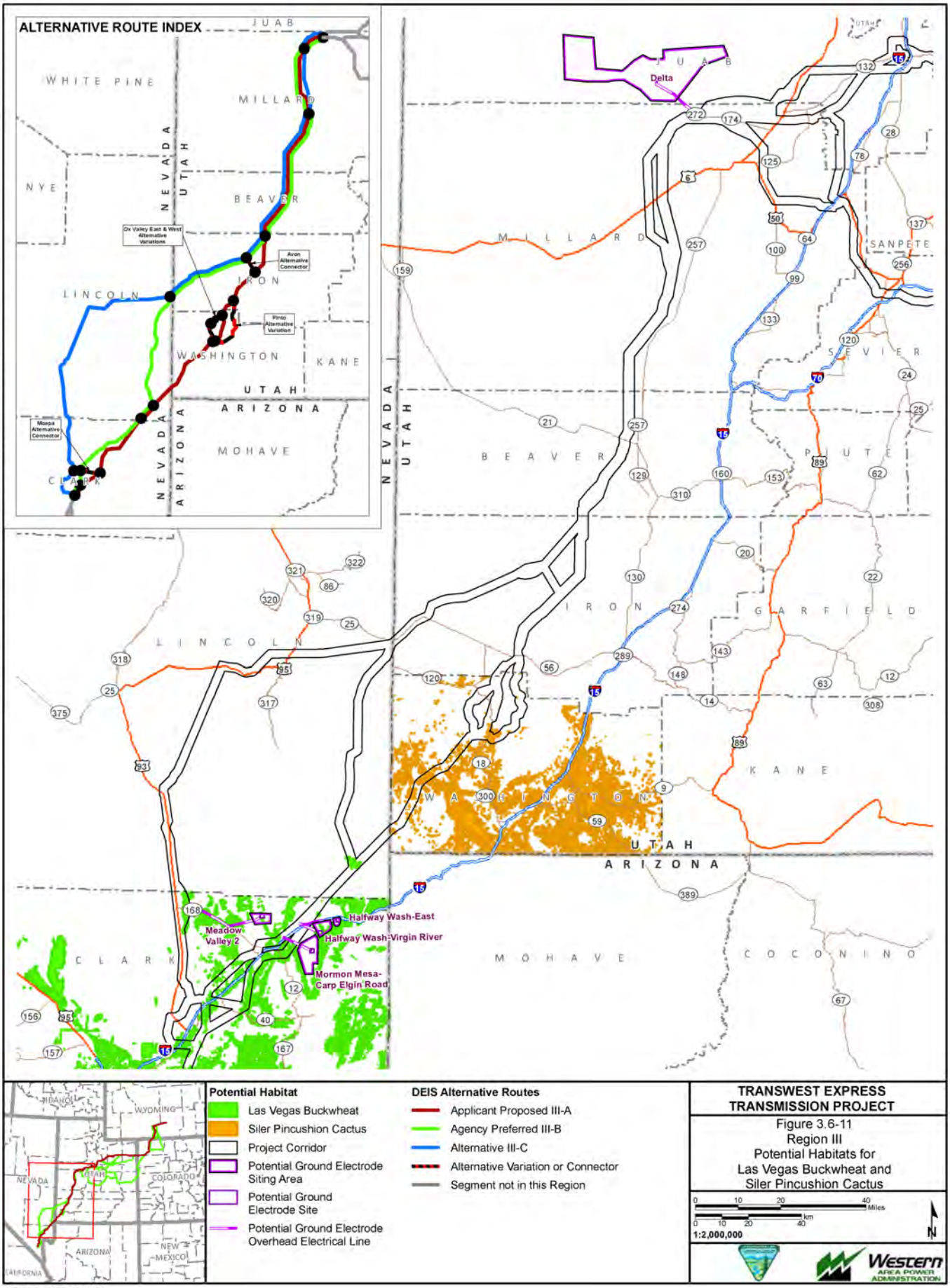
WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. Based on the limited occurrence of known locations in Alternative III-A, direct impacts to this species are not anticipated, but the extensive area of potential habitat makes total avoidance of Las Vegas buckwheat habitat unlikely. With implementation of mitigation measures **SS-5** and **SS-10**, in conjunction with mitigation measures **SS-1** and **SS-3**, WWEC BMP's, and TWE's design features, impacts to high quality habitats would be avoided. The areas not avoided would result in loss of suitable habitat for the species. For these areas, impacts would be as described in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

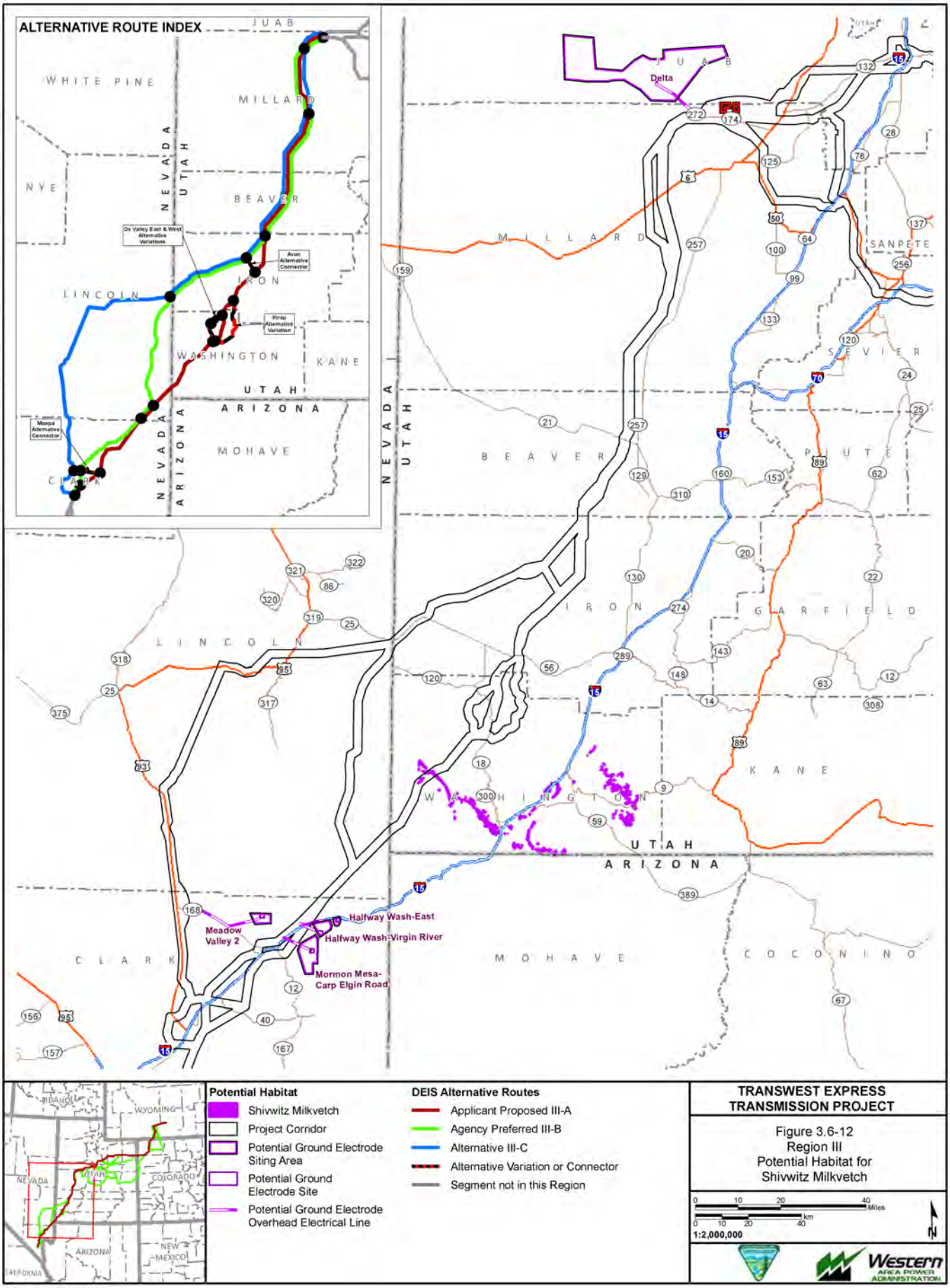
Federal Species Identified as having Potential Habitat

Within Alternative III-A 2-mile corridor, there is potential habitat identified for Shivwitz milkvetch and Siler pincushion cactus as presented in **Table 3.6-13** and illustrated in **Figures 3.6-11** and **3.6-12**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative III-A corridor. No critical habitat has been designated for Siler pincushion cactus. Although critical habitat has been designated for the Shivwitz milkvetch, the corridor is located approximately five miles northwest of the closest critical habitat location.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the aforementioned species are not anticipated. If these species are identified during site-specific surveys, impacts would be avoided based on mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, and impact minimization and mitigation measures would be developed in consultation with the USFWS, BLM, and Western prior to construction.

To minimize and mitigate impacts to all potential sensitive plant species habitats within the 2-mile transmission line corridors, WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the limited range of both species, and the amount of acreage potential habitat identified for them, no impacts are anticipated for these species under Alternative III-A.


ALTERNATIVE ROUTE INDEX
JUAB
WHITE PINE
MILLARD
NYE
NEVADA
UTAH
BEAVER
Dry Valley East & West Alternative Variations
Avon Alternative Connector
IRON
LINCOLN
Pinto Alternative Variation
WASHINGTON
KANE
UTAH
ARIZONA
Moapa Alternative Connector
MOHAVE
CLARK
Delta
SANPETE
SEVIER
PIUTE
GARFIELD
Halfway Wash-East
Halfway Wash-Virgin River
Meadow Valley 2
Mormon Mesa-Carp Elgin Road
COCONINO
IDAHO
WYOMING
COLORADO
NEW MEXICO
CALIFORNIA
Potential Habitat
Las Vegas Buckwheat
Siler Pincushion Cactus
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-11
Region III
Potential Habitats for
Las Vegas Buckwheat and
Siler Pincushion Cactus
Miles
km
1:2,000,000
N
Western AREA POWER ADMINISTRATION
Exported On: 6/5/2013



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BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the corridors associated with Alternative III-A: Beaver Dam breadroot, Jones' globemallow, Las Vegas buckwheat, rosy twotone beardtongue, silverleaf sunray, sticky buckwheat, sticky ringstem, pinyon penstemon, and threecorner milkvetch. Based on a desktop review, potential habitat has been identified for 31 BLM sensitive species within the Alternative III-A corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the corridors vary from species that are found across a wide range of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, shrub and pinyon-juniper communities, sandy soils, barren, rocky, sparsely vegetated areas, shrub-steppe communities, mountain and mixed desert shrub communities, grasslands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren or sparsely vegetated areas, would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and pinyon-juniper communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat.

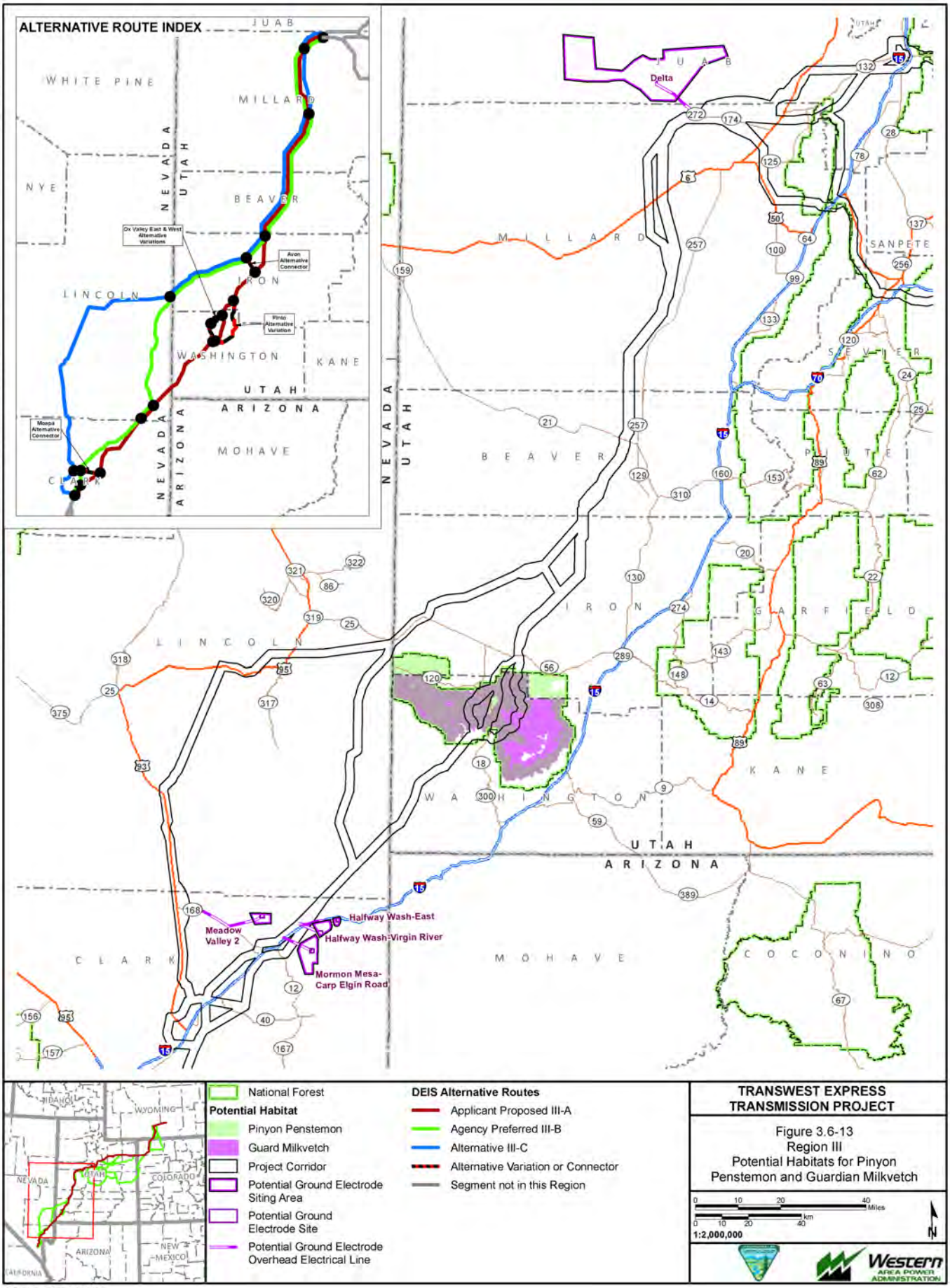
Site- and species-specific surveys within suitable habitat, and subsequent avoidance of documented occurrences, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, one species, the pinyon penstemon, has been identified within the Alternative III-A corridor. Within Alternative III-A, potential habitat has been identified for pinyon penstemon. Pinyon penstemon is listed in the Dixie National Forest. Associated species range and habitat descriptions for this species is provided in **Appendix G**, **Table G-1**. Potential habitats are illustrated in **Figure 3.6-13**.

Within the analysis area, pinyon penstemon is found entirely in Dixie National Forest. The potential habitat of 15,573 acres is found extensively in large contiguous sections through the corridor for this alternative.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, design features, applicant-committed protection measures, and proposed mitigation measures, direct and indirect impacts are not anticipated.


ALTERNATIVE ROUTE INDEX
WHITE PINE
NYE
MILLARD
BEAVER
LINCOLN
IRON
WASHINGTON
KANE
UTAH
ARIZONA
MOHAVE
CLARK
NEVADA
Dix Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
Delta
SANPETE
SEVIER
PIUTE
GARFIELD
COCONINO
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
IDAHO
WYOMING
COLORADO
NEW MEXICO
CALIFORNIA
National Forest
Potential Habitat
Pinyon Penstemon
Guard Milkvetch
Project Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.6-13
Region III
Potential Habitats for Pinyon Penstemon and Guardian Milkvetch
Miles
km
1:2,000,000
N
Western AREA POWER ADMINISTRATION
Exported On: 6/5/2013

The WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. For both species, total avoidance of habitat may not be feasible based on the extensive coverage of the potential habitat within the corridor associated with this Alternative. To minimize impacts to suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species.

Nevada State Listed Species

Based on species occurrence data and agency consultation, the following three Nevada state listed species have been identified within the Alternative III-A corridor: threecorner milkvetch, Las Vegas buckwheat, and sticky buckwheat. Based on a desktop review, potential habitat within the Alternative III-A 2-mile corridor has been identified for the following four Nevada state listed species: Las Vegas bearpoppy, threecorner milkvetch, Las Vegas buckwheat, and sticky buckwheat. Associated species ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Potential Project-related impacts to State of Nevada-listed sensitive species would be the same as described above for Alternative III-A Las Vegas Buckwheat and Alternative III-A BLM Sensitive Species.

<u>Alternative III-B (Agency Preferred)</u>

Las Vegas Buckwheat (Federal Candidate)

Within Alternative III-B 2-mile corridor, there are approximately 4,442 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-13** and illustrated in **Figure 3.6-11**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative III-B corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the location of the potential habitat identified in the corridor for this alternative, and the occurrence of known locations in Alternative II-B, total avoidance of potential habitat for this species may not be feasible. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Federal Species Identified as having Potential Habitat

Within Alternative III-B 2-mile corridor, there is potential habitat identified for Ute ladies'-tresses orchid as presented in **Table 3.6-13**. Based on species occurrence data and agency consultation, no individuals or populations of this species have been identified within the Alternative III-B corridor. No critical habitat has been designated for Ute ladies'-tresses orchid.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the Ute ladies'-tresses are not anticipated. If this species is identified during site-specific

surveys, impacts would be avoided based on mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, and impact minimization and mitigation measures would be developed in consultation with the USFS, and Western prior to construction.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative III-B corridor: Beaver Dam breadroot, Las Vegas buckwheat, pink egg milkvetch, yellow twotone beardtongue, sticky buckwheat, sticky ringstem, threecorner milkvetch, straw milkvetch, and Veyo milkvetch. Based on a desktop review, potential habitat has been identified for 38 BLM sensitive species within the Alternative III-B corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative III-B corridor vary from species that are found across a wide range of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, shrub and conifer communities, sandy soils, barren, rocky, sparsely vegetated areas, badlands, mountain and mixed desert shrub communities, grasslands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren or sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and pinyon-juniper communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitats.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation, direct and indirect impacts are not anticipated.

Nevada State Listed Species

Based on species occurrence data and agency consultation, the following three Nevada state listed species have been identified within the Alternative III-B corridor: Las Vegas buckwheat, pink egg milkvetch, and Veyo milkvetch. Based on a desktop review, potential habitat has been identified in the Alternative III-B 2-mile corridor for the following Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, sand cholla, pink egg milkvetch, Ute ladies'-tresses orchid, and Veyo milkvetch, within the Alternative III-B corridor. Sand cholla is protected in the State of Nevada as a Cacti, Yucca, or Christmas Tree species. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to state-sensitive species under Alternative III-B would be the same as those described above for Alternative III-A for Las Vegas Buckwheat and Alternative III-A for BLM Sensitive Species.

Alternative III-C

Las Vegas Buckwheat (Federal Candidate)

Within Alternative III-C, there are approximately 7,088 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-13** and illustrated in **Figure 3.6-11**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative III-C corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

To minimize and mitigate impacts to potential habitat WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the location of the potential habitat identified in the corridor for this alternative, and the occurrence of known locations in Alternative II-B, total avoidance of potential habitat for this species may not be feasible. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Ute Ladies'-Tresses Orchid (Federally Threatened)

Within Alternative III-C, approximately 977 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-13**. Based on species occurrence data and agency consultation, no individuals or populations of this species have been identified within the Alternative III-C corridor. No critical habitat has been designated for Ute ladies'-tresses orchid. Implementation of BMPs, design features, and mitigation measures and associated effects would be similar as presented for Alternative I-A; therefore, no impacts to Ute ladies'-tresses orchid and its associated habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following seven species have been identified within the Alternative III-C 2-mile corridor: Las Vegas buckwheat, Needle Mountains milkvetch, pink egg milkvetch, rosy twotone beardtongue, silverleaf sunray, white bearpoppy, and White River catseye. Based on a desktop review, potential habitat has been identified for 38 BLM sensitive species within the Alternative III-C corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative III-C 2-mile corridor vary from species that are found across a wide range of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, shrub and conifer communities, sandy soils, barren, rocky, sparsely vegetated areas, badlands, mountain and mixed desert shrub communities, grasslands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren or sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and pinyon-juniper communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitats.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

Nevada State Listed Species

Based on species occurrence data and agency consultation, the only Nevada state listed species that has been identified within the Alternative III-C 2-mile corridor is the Las Vegas buckwheat. Based on a desktop review, potential habitat has been identified in the Alternative III-C 2-mile corridor for the following six Nevada state listed species: Las Vegas bearpoppy, Las Vegas buckwheat, sand cholla, sticky buckwheat, Ute ladies'-tresses orchid, and threecorner milkvetch. Sand cholla is protected in the State of Nevada as a Cacti, Yucca, or Christmas Tree species. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Potential Project-related impacts would be the same as those described above under Alternative III-A for Las Vegas Buckwheat and under Alternative III-A for BLM Sensitive Species.

Alternative Variations in Region III

Table 3.6-14 provides a comparison of impact parameters associated with the alternative variations in Region III based on known occurrences and potential habitat identification within the 2-mile transmission line corridors. Based on species occurrence information and habitat associations, five special status plant species may be impacted by the Project in Region III including three BLM sensitive species, one Forest sensitive species, and one federally listed species. **Figures 3.6-11** and **3.6-13** illustrate the potential habitats for the one federally listed and one Forest sensitive species associated with the Region III alternative variations.

Table 3.6-14 Summary of Region III Alternative Variation Impacts for Special Status Plant Species

Parameter	Ox Valley East Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Ox Valley West Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Pinto Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A
Federally Listed Species						
Number of species with known occurrences impacted[1]	0	0	0	0	0	0
Number of species with potential habitat impacted [1]	0	1	0	1	1	1
Acreage of critical habitat impacted	N/A	N/A	N/A	N/A	N/A	N/A
Acreage of Siler Pincushion Cactus potential habitat impacted[1]	0	60	0	60	407	60

Table 3.6-14 Summary of Region III Alternative Variation Impacts for Special Status Plant Species

Parameter	Ox Valley East Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Ox Valley West Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Pinto Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A
BLM Sensitive Species						
Number of species with known occurrences impacted[1]	0	0	0	0	0	1
Number of species with potential habitat impacted[1]	2	2	2	2	3	3
USFS Sensitive Species						
Number of species with known occurrences impacted[1]	0	0	0	0	0	1
Number of species with potential habitat impacted	1	1	1	1	1	1
Acreage of Pinyon Penstemon potential habitat impacted	9,140	12,115	5,404	12,115	16,650	15,373
Nevada State Listed Species						
Number of species with known occurrences impacted	0	0	0	0	0	0
Number of species with potential habitat impacted	0	0	0	0	0	0

Alternative Connectors in Region III

Table 3.6-15 summarizes the impacts and advantages/disadvantages associated with the two alternative connectors in Region III based on known occurrences and potential habitat identification within the 2-mile transmission line corridors.

Alternative Ground Electrode Systems in Region III

The southern electrode system would be required within 100 miles of the southern terminal, which is based on the conceptual locations and connections to the alternative routes. **Table 3.6-16** provides a comparison of impact parameters associated with the alternative ground electrodes in Region III based on known occurrences and potential habitat identification within the ground electrode system siting areas. Based on species occurrence information and habitat associations, 15 BLM sensitive species and three Nevada state listed species may be impacted by the Project in Region III.

Table 3.6-15 Summary of Region III Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Advantage
Avon Alternative Connector	No special status plant species or their associated habitats are present within the 2-mile transmission line corridor.	No impacts to special status plant species or their associated habitats are anticipated.

Table 3.6-15 Summary of Region III Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Advantage
Moapa Alternative Connector	• Known populations of the threecorner milkvetch (BLM sensitive and NV-State listed), silverleaf sunray (BLM sensitive), sticky buckwheat (BLM sensitive and Nevada state listed), and Schlesser pincushion (BLM sensitive) are located within the 2-mile transmission line corridor, and could be impacted by Project- related activities. • Potential habitat for one federally listed species (Las Vegas buckwheat [approximately 1,472 acres]); fourteen BLM sensitive species (Las Vegas buckwheat, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, rosy twotone beardtongue, parish phacelia, and Schlesser pincushion); and four Nevada state listed species (Las Vegas buckwheat, Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-11** illustrates the potential habitat for the Las Vegas buckwheat.	The disadvantage of using this alternative connector would include potential loss of individuals of four BLM sensitive species and two Nevada state listed species and potential habitat disturbance to one federally listed species, fourteen BLM sensitive species, and four Nevada state listed species.

Table 3.6-16 Summary of Region III Alternative Ground Electrode Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa-Carp Elgin Rd (Alternatives III-A and III-B)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Known populations of the Beaver Dam breadroot (BLM sensitive species) and the threecorner milkvetch (BLM sensitive species and State listed species) are located within the ground electrode system siting areas, and could be impacted by Project-related activities. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and three Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.

Table 3.6-16 Summary of Region III Alternative Ground Electrode Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Halfway Wash-Virgin River (Alternatives III-A and III-B)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • No impacts to BLM sensitive and Nevada state listed species would occur based on lack of documented occurrences. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and 3 Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.
Halfway Wash East (Alternatives III-A and III-B)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • No impacts to BLM sensitive and Nevada state listed species would occur based on lack of documented occurrences. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and 3 Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.
Meadow Valley 2 (Alternative III-C)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • No impacts to BLM sensitive and Nevada state listed species would occur based on lack of documented occurrences. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and 3 Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.
Delta (Design Option 2) (All Alternatives)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Known populations of the ibex buckwheat (BLM sensitive species) are located within the ground electrode system siting area, and could be impacted by Project-related activities. • Potential habitat for four BLM sensitive species (Arabis goodrichii, giant fourwing saltbush, ibex buckwheat, and Neese narrowleaf penstemon is located within the ground electrode system siting area, and could be impacted by Project-related activities.

Region III Conclusion

Within Region III, Alternative III-A would impact the greatest amount of potential habitat for federally listed species and all alternatives would impact known federally listed species populations equally. Alternatives III-B and III-C would impact the greatest number of BLM species; Alternative III-A would impact the greatest number of USFS species and potential habitat. Alternatives III-B and III-C do not have any impacts to USFS species. Alternative III-B impacts the greatest number of Nevada state-listed species populations.

3.6.6.6 Region IV

Table 3.6-17 provides a comparison of impact parameters associated with the alternative routes in Region IV based on known occurrences and potential habitat identified within the 2-mile transmission line corridors for special status plant species. Based on species occurrence information and habitat associations, 20 special status plant species may be impacted by the Project in Region IV including 18 BLM sensitive species, five Nevada state listed species, 8 NPS-Lake Mead NRA sensitive species, and one federally listed species. To determine the location and spatial extent of potentially suitable habitat for federally listed species within the 2-mile transmission line corridors, a habitat assessment was conducted using ArcGIS and best available GIS datasets based on the habitat characteristics associated with individual species. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan under development. Species occurrence and associated habitats in Region IV are provided in **Appendix G**, **Table G-1**.

Table 3.6-17 Summary of Region IV Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Federally Listed Species			
Number of species with known occurrences impacted	0	0	0
Number of species with potential habitat impacted	1	1	1
Acreage of critical habitat impacted	--	--	--
Acreage of Las Vegas Buckwheat potential habitat impacted	7,308	2,636	6,569
BLM Sensitive Species			
Number of species with known occurrences impacted	4	3	2
Number of species with potential habitat impacted	19	18	16
NPS Lake Mead NRA Sensitive Species			
Number of species with known occurrences impacted	0	2	2
Number of species with potential habitat impacted	0	2	2
Nevada State Listed Species			
Number of species with known occurrences impacted	1	1	1
Number of species with potential habitat impacted	5	5	5

Alternative IV-A (Applicant Proposed and Agency Preferred)

Las Vegas Buckwheat (Federal Candidate)

Within Alternative IV-A, there is approximately 7,308 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-17** and illustrated in **Figure 3.6-14**. Based on species occurrence data and agency consultation, no Las Vegas buckwheat individuals or populations have been identified within the Alternative IV-A corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

WWEC BMPs, TWE design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Because Alternative IV-A parallels sensitive species habitat, total avoidance of this species may not be feasible. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

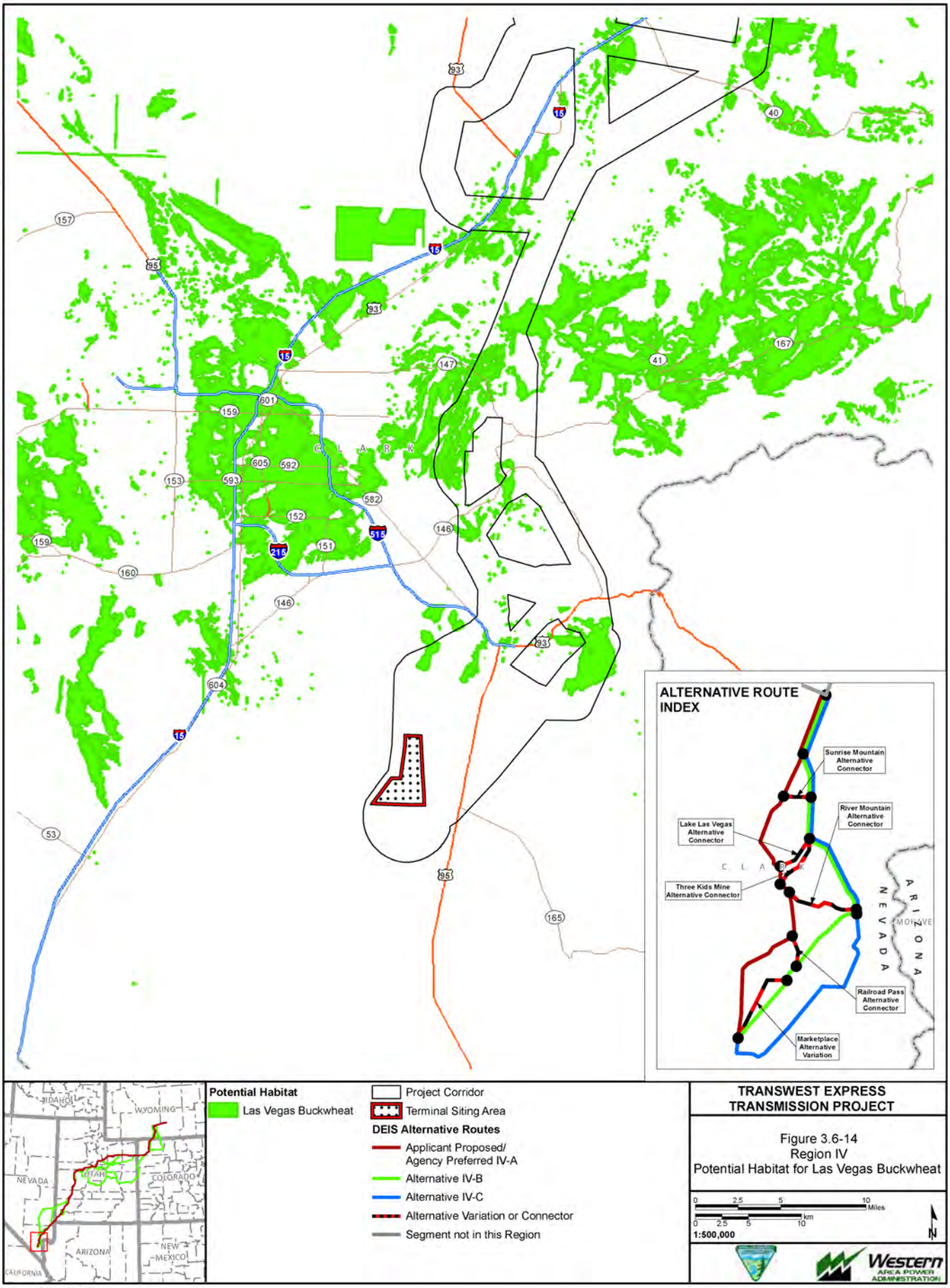
BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative IV-A corridor: Las Vegas bearpoppy, silverleaf sunray, sticky ringstem, and rosy twotone beardtongue. Based on a desktop review, potential habitat has been identified for 19 BLM sensitive species within the corridors associated with Alternative IV-A. Associated species ranges and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative IV-A 2-mile corridor range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, sandy soils, barren, rocky, sparsely vegetated areas, badlands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.



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Nevada State Listed Species

Based on species occurrence data and agency consultation, one Nevada State-listed sensitive species, the Las Vegas bearpoppy, has been identified within the Alternative IV-A corridor. Potential habitat has been identified in the Alternative IV-A 2-mile corridor for the following five Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, Las Vegas catseye, sticky buckwheat, and threecorner milkvetch. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**.

Impacts to state-listed sensitive species would be the same as described under Alternative IV-A for Las Vegas Buckwheat and under Alternative IV-A for BLM Sensitive Species.

Alternative IV-B

Las Vegas Buckwheat (Federal Candidate)

Within Alternative IV-B, there are approximately 2,636 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-17** and illustrated in **Figure 3.6-14**. Based on species occurrence data and agency consultation, no Las Vegas buckwheat individuals or populations have been identified within the Alternative IV-B corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

The WWEC BMPs, TWE design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the location of the one area of potential habitat within the Alternative IV-A 2-mile corridor, impacts are not anticipated for Las Vegas buckwheat under this alternative. The areas not avoided would result in loss of suitable habitat for the species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative IV-B corridor: Las Vegas bearpoppy, rosy twotone beardtongue, and silverleaf sunray. Based on a desktop review, potential habitat has been identified for 18 BLM sensitive species within the Alternative IV-B corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Based on the similarity in vegetative communities and species impacted, potential Project-related impacts to the Las Vegas bearpoppy and silverleaf sunray would be the same as described above for Alternative IV-A.

Nevada State Listed Species

Based on species occurrence data and agency consultation, one species, the Las Vegas bearpoppy, has been identified within the Alternative IV-B corridor. Potential habitat has been identified for the following five Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, Las Vegas catseye, sticky buckwheat, and threecorner milkvetch within the Alternative IV-B corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Impacts to state-listed sensitive species under Alternative IV-B would be the same as described above for Alternative IV-A Las Vegas Buckwheat and Alternative IV-A BLM Sensitive Species.

National Park Service Sensitive Species

Based on species occurrence data and agency consultation, two species, the Las Vegas bearpoppy, and silverleaf sunray, have been identified within the Alternative IV-B corridor. Based on a desktop

review, potential habitat has been identified for two National Park Service sensitive species within the Alternative IV-B corridor. Associated species ranges and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Impacts to NPS-listed sensitive species under Alternative IV-B would be the same as described above for Alternative IV-A BLM Sensitive Species.

Alternative IV-C

Las Vegas Buckwheat (Federal Candidate)

Within the Alternative IV-C 2-mile corridor, there are approximately 6,569 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-17** and illustrated in **Figure 3.6-14**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative IV-C corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

The BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. TWE's applicant-committed protection measures ECO-1 and ECO-4 (**Appendix C**) would avoid suitable, sensitive-species habitats during Project design and implementation. Site and species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the location of the potential habitat with the corridor for this alternative, impacts to Las Vegas buckwheat are not anticipated under this alternative.

BLM Sensitive Species

Based on species occurrence data and agency consultation, two species, the Las Vegas bearpoppy and the silverleaf sunray, have been identified within Alternative IV-C corridor. Based on a desktop review, potential habitat has been identified for 16 BLM sensitive species within the Alternative IV-C corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Based on the similarity in vegetative communities and species impacted, impacts to BLM-listed sensitive species would be the same as described above for Alternative IV-A.

Nevada State Listed Species

Based on species occurrence data and agency consultation, one species, the Las Vegas bearpoppy, has been identified within the Alternative IV-C 2-mile corridor. Potential habitat has been identified in this alternative for the following five Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, Las Vegas catseye, sticky buckwheat, and threecorner milkvetch. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to Nevada state-listed sensitive species under Alternative IV-C would be the same as described above for Alternative IV-A Las Vegas Buckwheat and Alternative IV-A BLM Sensitive Species.

National Park Service Sensitive Species

Based on species occurrence data and agency consultation, two species, the Las Vegas bearpoppy and silverleaf sunray, have been identified within the Alternative IV-C corridor. Based on a desktop review, potential habitat has been identified for these two National Park Service sensitive species within the Alternative IV-C corridor. Associated range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to National Park Service sensitive species would be the same as described above for Alternative IV-A BLM Sensitive Species.

Alternative Variations in Region IV

Table 3.6-18 provides a comparison of impact parameters associated with the alternative variations in Region IV based on known occurrences and potential habitat for special status plant species identified within the 2-mile transmission line corridors. Based on species occurrence information and habitat

associations, 14 special status plant species may be impacted by the Project in Region IV including one federally listed species (Las Vegas buckwheat), 13 BLM sensitive species, and five state listed species.

Table 3.6-18 Summary of Region IV Alternative Variation Impacts for Special Status Species

Parameter	Marketplace Alternative Variation (Alternative IV-B)	Comparable Portions of Alternative IV-B
Federally Listed Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	0	0
Acreage of critical habitat impacted	N/A	N/A
Acreage of Las Vegas buckwheat potential habitat impacted	87	0
BLM Sensitive Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	13	13
NPS Lake Mead NRA Sensitive Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	0	0
Nevada State Listed Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	5	5

Alternative Connectors in Region IV

Table 3.6-19 summarizes the impacts and advantages/disadvantages associated with the five alternative connectors in Region IV based on known occurrences and potential habitat identification within the 2-mile transmission line corridors.

Table 3.6-19 Summary of Region IV Alternative Connector Impacts for Special Status Species

Alternative Connector	Analysis	Impact Conclusion
Sunrise Mountain Alternative Connector	Potential habitat for one federally listed species (Las Vegas buckwheat [approximately 240 acres]); six NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, and rosy twotone beardtongue); 15 BLM sensitive species (Las Vegas buckwheat, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, catchfly gentian, rosy twotone beardtongue, parish phacelia, and St. George blue-eyed grass); and five Nevada state listed species (Las Vegas buckwheat, Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, and sticky buckwheat) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the silverleaf sunray (NPS-Lake Mead NRA and BLM sensitive species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one NPS-Lake Mead NRA sensitive species and one BLM sensitive species and potential habitat disturbance to one federally listed species, six NPS-Lake Mead NRA sensitive species, 15 BLM sensitive species, and five Nevada state listed species.

Table 3.6-19 Summary of Region IV Alternative Connector Impacts for Special Status Species

Alternative Connector	Analysis	Impact Conclusion
Lake Las Vegas Alternative Connector	Potential habitat for one federally listed species (Las Vegas buckwheat [approximately 337 acres]); five NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, and rosy twotone beardtongue); 14 BLM sensitive species (Las Vegas buckwheat, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, catchfly gentian, sticky buckwheat, rosy twotone beardtongue, and parish phacelia); and four Nevada state listed species is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the silverleaf sunray (NPS-Lake Mead NRA and BLM sensitive species) and Las Vegas bearpoppy (NPS-Lake Mead NRA and BLM sensitive species, and Nevada State listed species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of two NPS-Lake Mead NRA sensitive species, two BLM sensitive species, and one Nevada state listed species and potential habitat disturbance to one federally listed species, five NPS-Lake Mead sensitive species, 14 BLM sensitive species, and four Nevada state listed species.
Three Kids Mine Alternative Connector	Potential habitat for one federally listed species (i.e., Las Vegas buckwheat [approximately 399 acres]); six NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, and rosy twotone beardtongue), 14 BLM sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Las Vegas buckwheat, alkali mariposa lily, Gold Butte moss, sticky buckwheat, catchfly gentian, rosy twotone beardtongue, and parish phacelia); and five Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, Las Vegas buckwheat, and sticky buckwheat) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the silverleaf sunray (NPS-Lake Mead NRA and BLM sensitive species), and Las Vegas bearpoppy (NPS-Lake Mead NRA sensitive, BLM sensitive species, and Nevada State listed species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals from two NPS-Lake Mead NRA sensitive species, two BLM sensitive species, and one Nevada state listed species and potential habitat disturbance to one federally listed species, six NPS-Lake Mead sensitive species, 14 BLM sensitive species, and five Nevada state listed species.
River Mountain Alternative Connector	Potential habitat for one federally listed species (i.e., Las Vegas buckwheat [approximately 30 acres]); six NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, and rosy twotone beardtongue); 14 BLM sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, Las Vegas buckwheat, sticky buckwheat, catchfly gentian, white-margined beardtongue, rosy twotone beardtongue, and parish phacelia); and five Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, Las Vegas buckwheat, sticky buckwheat) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the rosy twotone beardtongue (BLM sensitive species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals from one BLM sensitive species and potential habitat disturbance to one federally listed species, six NPS-Lake Mead sensitive species, 14 BLM sensitive species, and five Nevada state listed species.

Table 3.6-19 Summary of Region IV Alternative Connector Impacts for Special Status Species

Alternative Connector	Analysis	Impact Conclusion
Railroad Pass Alternative Pass	Potential habitat for one federally listed species (i.e., Las Vegas buckwheat [approximately 130 acres]); seven NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, Mokiak milkvetch, sticky buckwheat, and rosy twotone beardtongue); 13 BLM sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, Las Vegas buckwheat, sticky buckwheat, rosy twotone beardtongue, and parish phacelia); and five Nevada state listed species (Las Vegas buckwheat, Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, sticky buckwheat) is located within the 2-mile corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat.	The disadvantage of using this alternative connector would include potential habitat disturbance to one federally listed species, seven NPS-Lake Mead sensitive species, 13 BLM sensitive species, and five Nevada state listed species.

Region IV Conclusion

Within Region IV, impacts to federally listed, and BLM, Nevada state listed species are fairly consistent between alternatives. Impacts to Lake Mead NRA sensitive species are found only in Alternatives IV-B and IV-C.

3.6.6.7 Impacts to Special Status Plant Species from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. The analysis area would exist under current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). Therefore, impacts to special status plant species associated with the development of the Project would not occur.

3.6.6.8 Residual Impacts

If species or habitat avoidance is not feasible due to physical, biological, or engineering constraints, the loss of those species and/or habitats would be a residual impact. Residual impacts would also result from indirect impacts such as fragmentation of suitable habitats, and establishment of noxious weeds and invasive species into previously undisturbed areas as a result of permanent placement of facilities and access roads. Depending on the length of time for construction, and the reclamation success, pollinators that are also rare or specific to a certain special status plant species could be impacted by the Project.

Vegetation recovery to similar cover and species composition after implementation of a reclamation program is expected to occur at varying rates. Reclamation and recovery timeframes for each vegetation cover type are presented in Section 3.5.6.8, Residual Impacts. Some native habitats may not return to pre-construction conditions due to alteration of soil communities, noxious weed invasion, and loss of biological soil crusts. Fragmentation of native habitats and the conversion of vegetation communities may occur over the long term, depending on the success of reclamation and associated disturbance from maintenance activities over the life of the Project. Noxious weed and invasive species may persist over the long term regardless of the implementation of control programs.

3.6.6.9 Irreversible and Irretrievable Commitment of Resources

All potential operation impacts to special status habitats within the 2-mile transmission line corridor would be irretrievable until transmission line decommissioning, after which time all land uses could be reclaimed. However, reclamation activities may have limited success in areas with poor soils, some vegetation communities would take years to reestablish, and some areas may never return to their

former vegetation cover and composition. As such, these impacts may represent an irreversible commitment of special status plant resources. Additionally, any fragmentation of native habitats and subservient establishment of noxious weeds and invasive species, resulting in the conversion of native plant communities that could not be reclaimed to pre-construction conditions after transmission line decommissioning these impacts would be considered irreversible.

3.6.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

Long-term impacts to special status plant species include the disturbance of suitable habitat that may require extended time (10 to 100 years) for recovery, the potential for weedy annual species such as halogeton and cheatgrass to become established in localized areas increasing competition on special status plant species, the loss of species-specific pollinators, and the conversion of native habitats.

3.7 Wildlife

3.7.1 Regulatory Background

Regulations that directly influence wildlife management decisions within the wildlife analysis area are primarily implemented by the BLM, USFS, USFWS, and state wildlife agencies. These consist of the Wyoming Game and Fish Department (WGFD), Colorado Parks and Wildlife (CPW) (formerly Colorado Division of Wildlife [CDOW]), Utah Division of Wildlife Resources (UDWR), and Nevada Department of Wildlife (NDOW). The wildlife regulations relevant to the proposed project are presented in **Table 3.7-1**.

Table 3.7-1 Relevant Regulations for Wildlife Species

Wildlife Species	Regulation
Big Game	• Wyoming Statutes 23-3-102; • Colorado Revised Statutes 33-1-101; • Utah Code 23-14-1, 23-16, and Rules R657-5; and • Nevada Administrative Code 503-020.
Small Game	• Wyoming Statutes 23-3-103; • Colorado Revised Statutes 33-1-101; • Utah Code 23-14-1, 23-48, and Rules R657-6, R657-9, R657-10, R657-11, R657-33, and R657-54; and • Nevada Administrative Code 503-020, 503-025, 503-045.
Nongame (including raptors, migratory birds, and reptiles)	• Migratory Bird Treaty Act (16 USC 703 et seq.); • Bald and Golden Eagle Protection Act (16 USC 668 et seq.); • Executive Order (EO) 13186 (66 FR 3853); • BLM MOU WO-230-2010-04 • BLM IM WY-2013-005 • FS Agreement # 08-MU-1113-2400-264 • USFS Land and Resource Management Plans (LRMPs) • Wyoming Statutes 23-1-101, 23-1-103, 23-1-302 and 23-3-108); • Colorado Revised Statutes 33-1-101, 33-2-104; • Utah Code 23-14-1, and Rules R657-3, R65713, R657-19, and R657-53; and • Nevada Administrative Code 503-030, 503-050, 503-075, 503-080.

3.7.2 Data Sources

Information regarding wildlife species and their habitats within the wildlife analysis area was obtained from a review of existing published sources, BLM resource management plans, USFS land and resource management plans (forest management plans), BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. GIS shapefiles of big game habitat (e.g., crucial winter range, parturition habitat, migration corridors, etc.) were obtained from the WGFD, CPW, UDWR, and NDOW and reviewed for this project. This information is updated regularly and presents the most accurate habitat data for the wildlife analysis area. In addition, information received through correspondence with agency wildlife biologists has been incorporated, as appropriate. Species-specific surveys for the agency-preferred alternative will be completed after that alternative has been finalized and results of those surveys will be incorporated into the final EIS.

3.7.3 Analysis Areas

The analysis areas for wildlife species were chosen because they represent the combination of geographic areas containing contiguous habitat that would be impacted by the proposed project, as well as the management regimes to which this habitat is subject. Accordingly, these analysis areas provide a clear disclosure of the context of project impacts in light of the management considerations for these areas. The analysis areas are based in part on HUC10 watershed boundaries. HUC 10 watershed refers to the 10-digit hydrologic unit codes specifying the 5th-level watershed boundaries that were originally delineated by the USGS and subsequently refined by the NRCS. These watershed areas average from approximately 40,000 – 250,000 acres in size and provide a clear bio-geographical delineation of vegetation communities and wildlife habitats. Section 3.4, Water Resources presents tables and figures of HUC 10 watersheds in the wildlife analysis area.

Three analysis areas for wildlife species are defined as follows:

- The wildlife analysis area for small game species, nongame species, raptors, migratory birds, Audubon Important Bird Areas (IBAs), and USFWS Bird Habitat Conservation Areas (BHCAs) includes suitable habitat within the HUC 10 watersheds crossed by Project alternatives.

- The big game analysis area includes the most important and limiting seasonal habitat (e.g., crucial winter range, parturition range) within all state big game management units located within HUC 10 watersheds crossed by the Project. This analysis area provides the context for project and cumulative impacts on habitat specifically managed by state agencies for big game populations.

- The MIS Analysis Area for USFS MIS includes suitable habitat within the entire national forest(s) for which they are identified. The exceptions are mule deer and Rocky Mountain elk, which are MIS but are analyzed under the big game analysis area described above. This MIS Analysis Area was chosen because it allows disclosure of the context of impacts within the unique requirements of the USFS for monitoring and managing MIS within the jurisdiction of NFS lands. Seven MIS are also accorded special status as BLM, state-listed, or federal candidate species and are analyzed in Chapter 3.8, Special Status Wildlife Species.

Table 3.7-2 presents the acreages of the major vegetation communities providing wildlife habitat within the wildlife analysis area.

Table 3.7-2 Vegetation Communities Within the Wildlife Analysis Area

Vegetation Community	Acres Within the Wildlife Analysis Area[1]	Percent of the Wildlife Analysis Area
1. Agricultural Land	784,433	3.1
2. Aspen Forest and Woodland	641,483	2.6
3. Barren/Sparsely Vegetated	321,697	1.3
4. Cliff and Canyon	816,392	3.3
5. Conifer Forest	539,604	2.2
6. Deciduous Forest	13,933	0.1
7. Desert Shrubland	3,074,124	12.3
8. Developed/Disturbed Land[2]	988,126	4.0
9. Dunes	133,157	0.5
10. Grassland	1,537,916	6.2

Table 3.7-2 Vegetation Communities Within the Wildlife Analysis Area

Vegetation Community	Acres Within the Wildlife Analysis Area[1]	Percent of the Wildlife Analysis Area
11. Greasewood Flat	875,991	3.5
12. Herbaceous Wetland	188,239	0.8
13. Montane Grassland	70,313	0.3
14. Montane Shrubland	875,292	3.5
15. Open Water	154,328	0.6
16. Pinyon-juniper	4,081,539	16.4
17. Riparian	68,489	0.3
18. Sagebrush Shrubland	6,539,728	26.2
19. Saltbush shrubland	2,991,796	12.0
20. Tundra	13,956	0.1
21. Woody Riparian and Wetlands	214,144	0.9
Total	**24,924,680**	**100**

[1] The wildlife analysis area includes suitable habitat within the HUC 10 watersheds crossed by the Project.

[2] The developed/disturbed vegetation community is not considered to be typical wildlife habitat and is not included in analyses.

Sources: USGS 2010, 2005, 2004 (SWReGAP and NWReGAP).

Table 3.7-3 presents the acreages of the major vegetation communities providing wildlife habitat within the MIS Analysis Area.

3.7.4 Baseline Description

As discussed in Section 3.5, Vegetation, 20 vegetation communities and developed/disturbed land are located within the wildlife analysis area. Developed/disturbed land is not considered to be typical wildlife habitat and is not included in analyses. Vegetation community/habitat types are presented in **Table 3.7-2**. Sagebrush shrubland, saltbush shrubland, desert shrub, and pinyon-juniper are the most common vegetation communities and account for 67 percent of the wildlife analysis area. A variety of wildlife species are associated with habitats found within the wildlife analysis area, with greater species diversity occurring in areas exhibiting greater vegetation structure, soil moisture, and open water, such as wetlands and riparian areas. Species that inhabit wetland and riparian habitats are limited to the perennial and intermittent drainages, reservoirs, lakes, ponds, and marshes that occur within the wildlife analysis area or in the immediate vicinity of these areas. The following sections (i.e., big game species, small game species, nongame species, migratory birds, including raptors, and USFS MIS) include baseline descriptions of both resident and migratory wildlife species that have either been documented within the wildlife analysis area or that may occur within the wildlife analysis area based on habitat associations. Detailed species descriptions by Project region are presented in Section 3.7.5, Regional Summary. Amphibians and fish are addressed in Sections 3.9, Aquatic Biological Resources, and 3.10, Special Status Aquatic Species.

3.7.4.1 Big Game Species

Big game species that occur within the big game analysis area include pronghorn, mule deer, white-tailed deer, elk, moose, Rocky Mountain bighorn sheep, desert bighorn sheep, black bear, and mountain lion

Table 3.7-3 Vegetation Communities/Habitat Types Within National Forests Crossed by the Project

Vegetation Community/ Habitat Type	Ashley National Forest Region II		Dixie National Forest Region III		Fishlake National Forest Region II		Manti-La Sal National Forest Region II		Uinta-Wasatch-Cache National Forest Region II	
	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest
1. Agriculture Land	2,691	0.2	629	<0.1	623	<0.1	1,466	0.1	290	<0.1
2. Aspen Forest and Woodland	102,261	7.7	196,825	10.5	196,958	13.5	234,483	17.5	231,663	25.9
3. Barren/Sparsely Vegetated	136,429	10.2	26,266	1.4	11,977	0.8	16,519	1.2	11,182	1.2
4. Cliff and Canyon	39,266	2.9	93,023	4.9	38,891	2.7	43,352	3.2	25,335	2.8
5. Conifer Forest	543,194	40.7	537,641	28.5	224,021	15.4	289,618	21.7	114,549	12.8
6. Deciduous Forest	1,125	0.1	0	0.0	1	<0.1	0	0.0	28,171	3.1
7. Desert Shrub	0	0.0	5,265	0.3	121	<0.1	1	<0.1	0	0.0
8. Developed/Disturbed[1]	42,056	3.1	26,479	1.4	28,664	2.0	4,505	0.3	497	0.1
9. Dunes	23	<0.1	2	<0.1	0	0.0	0	0.0	0	0.0
10. Grassland	1,591	0.1	2,010	0.1	7,453	0.5	104	<0.1	3,211	0.4
11. Greasewood Flat	1,891	0.1	19	<0.1	306	<0.1	80	<0.1	0	0.0
12. Herbaceous Wetland	28,424	2.1	4,438	0.2	4,530	0.3	2,789	0.2	15,225	1.7
13. Montane Grassland	25,557	1.9	12,854	0.7	9,129	0.6	26,225	2.0	26,455	3.0
14. Montane Shrubland	36,831	2.8	106,207	5.6	211,109	14.5	230,868	17.3	168,362	18.8
15. Open Water	21,383	1.6	2,445	0.1	4,334	0.3	2,282	0.2	16,673	1.9
16. Pinyon-Juniper	104,031	7.8	521,470	27.7	426,154	29.3	265,022	19.8	50,613	5.7
17. Riparian	119	<0.1	0	0.0	0	0.0	0	0.0	0	0.0
18. Sagebrush Shrubland	200,159	15.0	315,223	16.7	270,972	18.6	192,203	14.4	187,523	20.9
19. Saltbush Shrubland	15,422	1.2	497	<0.1	2,738	0.2	2,814	0.2	71	<0.1
20. Tundra	17,639	1.3	16,504	0.9	7,664	0.5	18,793	1.4	57	<0.1
21. Woody Riparian and Wetlands	15,120	1.1	15,660	0.8	8,234	0.6	6,028	0.5	15,377	1.7
Totals	**1,335,210**	**100**	**1,883,453**	**100**	**1,453,879**	**100**	**1,337,152**	**100**	**895,255**	**100**

[1] The developed/disturbed vegetation community is not considered to be typical wildlife habitat and is not included in analyses.

(BLM 2008; Fitzgerald et al. 2011; NDOW 2011; UDWR 2009a,b). Population numbers for these big game species typically fluctuate from year to year and depend on habitat conditions such as forage quality, water availability, and cover as well as weather patterns. The big game analysis area contains numerous big game seasonal habitats including migration corridors, production/parturition areas, and crucial winter range. Big game migration corridors and crucial winter range (defined as severe winter habitat in Colorado) have been identified by the WGFD, CPW, UDWR, and NDOW and are typically considered the most important and limiting habitats for big game species, especially during harsh winters with extremely cold temperatures and above average snow depths. Additional habitats such as parturition range (e.g., calving and fawning areas) may also be limiting in portions of the big game analysis area. Details on big game species and seasonal habitats found within the big game analysis area are presented below.

Pronghorn

Pronghorn inhabit grassland, desert shrubland, and sagebrush shrubland in flat to rolling topography and browse on grass, forbs, and shrubs, especially sagebrush, throughout the year. Pronghorn are prominent in portions of the big game analysis area with adequate forage and surface water (BLM 2008; Fitzgerald et al. 2011). During the winter, pronghorn generally utilize areas of relatively high sagebrush densities and overall low snow accumulations, on south- and west-facing slopes.

Mule Deer

Mule deer occur throughout the big game analysis area, but are concentrated in areas of rolling terrain and forested habitats (BLM 2008; Fitzgerald et al. 2011). A variety of vegetation communities provide suitable habitat for mule deer. These vegetation communities include aspen forests and woodlands, conifer forests, shrublands, and pinyon-juniper woodlands. Although their diet varies somewhat by season, mule deer are primarily browsers, feeding on a wide variety of woody vegetation including shoots, leaves, and twigs of shrubs and trees. Like pronghorn, winter habitat for mule deer occurs in areas of relatively high sagebrush densities and overall low snow accumulation, on south- and west-facing slopes.

White-tailed Deer

White-tailed deer occur in portions of the big game analysis area and are typically found near woody riparian and wetland areas in south-central Wyoming and northwestern Colorado (Fitzgerald et al. 2011). White-tailed deer feed on a variety of plant species but tend to rely heavily on agricultural fields, depending on the type of forage present (e.g., alfalfa, wheat, etc.). Winter habitat is typically low elevation riparian corridors and agricultural fields (BLM 2008). White-tailed deer are expanding their population westward in Wyoming and have increased in numbers considerably in the past 5 to 10 years in the North Platte River drainage. In northwestern Colorado, white-tailed deer are expanding their populations in agricultural areas along the Yampa River.

Elk

Elk occur in portions of the big game analysis area and are typically found in forested habitats, although in southern Wyoming and northwestern Colorado elk are found in large herds during the winter months in open sagebrush shrublands and grasslands (BLM 2008; CDOW 2011). Winter habitat for elk typically consists of low elevation rolling hills, meadows, and agricultural fields. However, unlike pronghorn and mule deer, elk are not as susceptible to harsh winter conditions due to their nutritional requirements and large body size and will often remain at higher elevations until snow depths reach approximately 16 inches (Fitzgerald et al. 2011).

Moose

Moose occur within the big game analysis area in portions of Wyoming and Utah (Fitzgerald et al. 2011; UDWR 2009b). This species is found in forested areas, primarily along riparian areas with abundant willow habitat. In Wyoming, this species has increased in numbers in the Baggs area along the Little Snake River as moose populations from the Park Range expand into southwestern Wyoming. Moose feed on a wide

variety of plants including trees, shrubs, grasses, forbs, algae, and other aquatic plants (Fitzgerald et al. 2011; UDWR 2009b). Generally, moose are not as susceptible to severe winter conditions as other big game animals due to their large body size that allows them to forage in deep snow. Consequently, many moose populations in Utah are found in the same habitats year-round (UDWR 2009b).

Rocky Mountain Bighorn Sheep

Rocky Mountain bighorn sheep occur in portions of the big game analysis area in Utah (UDWR 2008) and Colorado (CPW 2012), and are listed as USFS sensitive in the Uinta National Forest. This species is found in a variety of habitats from alpine to lower elevation foothills. Rocky Mountain bighorn sheep typically occupy steep, inaccessible habitat that provides them vantage points for predator detection and escape cover (CDOW 2009; Fitzgerald et al. 2011; UDWR 2008). This species feeds primarily on grasses, shrubs, and some forbs depending on the elevation of occupied habitat. Winter range for Rocky Mountain bighorn sheep typically consists of low elevation south-facing slopes that are blown free of snow cover. Rocky Mountain bighorn sheep are gregarious and exhibit high site-fidelity. In many areas of their range, this species spends the winter months in the same localized winter habitat each year (CDOW 2009; Fitzgerald et al. 2011; UDWR 2008).

Desert Bighorn Sheep

Desert bighorn sheep may occur within the big game analysis area in Utah and Nevada (NDOW 2001; UDWR 2008), and are listed as USFS sensitive in the Dixie, Fishlake, and Manti-LaSal National Forests. This species is found in desert shrubland and barren/sparsely vegetated habitats and is most common in steep, rocky terrain with abundant grass and browse (NDOW 2001; UDWR 2008). Water sources are often limited in desert bighorn sheep habitat; therefore, this species may occupy habitats near streams, springs, and man-made water sources (i.e., guzzlers) during the summer months (NDOW 2001). The diet of the desert bighorn sheep is similar to that of the Rocky Mountain bighorn sheep and consists primarily of grasses, shrubs, and forbs (NDOW 2001; UDWR 2008). Due to the geographic range of the desert bighorn sheep, use of seasonal habitats is primarily determined by water and forage availability rather than weather patterns and snow depth (UDWR 2008).

Black Bear

Black bear are classified as a big game species in Wyoming, Colorado, and Nevada. In Utah, black bear are managed under the furbearer program which provides certain protections. The species is fairly common within the big game analysis area, especially in forested, woody riparian, wetland areas along perennial water bodies (Fitzgerald et al. 2011). Black bears generally occur at low densities in habitats found within the big game analysis area and their distribution is dependent on existing and ongoing disturbance and on available food sources.

Mountain Lion

Mountain lions are classified as a big game species in Wyoming, Colorado, and Nevada. In Utah, mountain lions are managed under the furbearer program which provides certain protections. The species is fairly common within the big game analysis area, especially in forested, woody riparian and wetland areas along perennial water bodies (Fitzgerald et al. 2011). Mountain lions generally occur at low densities in habitats found within the big game analysis area and their distribution is dependent on available food sources, primarily mule deer.

3.7.4.2 Small Game Species

Small game species that occur within the wildlife analysis area include upland game birds, small mammals, furbearers, and waterfowl.

Upland Game Birds

Upland game bird species that occur within the wildlife analysis area include greater sage-grouse, Columbian sharp-tailed grouse, dusky grouse, ruffed grouse, chukar, ring-necked pheasant, wild turkey, Gambel's quail, California quail, band-tailed pigeon, and mourning dove. The greater sage-grouse is a federal candidate species, as well as a BLM, USFS, and Utah state sensitive species and is discussed in Section 3.8, Special Status Wildlife Species. The Columbian sharp-tailed grouse also is a BLM and Utah state sensitive species and is discussed in Section 3.8, Special Status Wildlife Species. Dusky grouse are found in forested areas of Wyoming, Colorado, and Utah in areas that contain aspen, chokecherry, serviceberry, Douglas-fir, lodgepole pine, and spruce/fir vegetation types (Kingery 1998; Stokes and Stokes 1996). Ruffed grouse are found in forested habitats in central Utah in areas that have a mixture of deciduous and coniferous trees (UDWR 2011). Chukars are found in central and western Utah, and Nevada in dry, rocky terrain with abundant cheatgrass (UDWR 2003). Depending on weather conditions, this species is often found near water sources (e.g., guzzlers, springs, seeps) in drainages that have sufficient escape cover. Ring-necked pheasants are found in the agricultural areas of central Utah and are relatively common in areas that provide sufficient cover (e.g., weedy fields, fence rows, grain fields, wetlands, ditches). Wild turkeys are found in Colorado, Utah, and Nevada and are typically associated with ponderosa pine and oakbrush habitats but also may be found in riparian and agricultural areas with suitable trees for roosting (Kingery 1998; UDWR 2011). The wild turkey is also identified as a MIS for the Dixie National Forest. Gambel's quail are found in Colorado, Utah, and Nevada, while California quail are found in Utah and Nevada (Stokes and Stokes 1996; UDWR 2011). These two species of quail occupy similar brushy habitats near riparian areas (Stokes and Stokes 1996). Band-tailed pigeons occur in Colorado and Utah in forests and mountain shrub habitats, primarily ponderosa pine and oakbrush (Kingery 1998). Mourning doves occur in habitats ranging from deciduous forests to shrubland and grassland communities, often nesting in trees or shrubs near riparian areas or water sources (Stokes and Stokes 1996). Most upland game bird species feed on a wide variety of plant and insect species depending on the time of year (i.e., insects during the spring and summer and leaves and seeds during the fall and winter). Many of the species described above exhibit annual population fluctuations depending on habitat conditions and weather patterns.

Small Game Mammals

Small game mammals that are likely to occur within the wildlife analysis area include mountain cottontail, desert cottontail, snowshoe hare, black-tailed jackrabbit, white-tailed jackrabbit, and pine squirrel (Fitzgerald et al. 2011). These species occupy a wide variety of habitats from high elevation coniferous forests to low elevation deserts and sagebrush shrubland. Most of these species are fairly abundant within suitable habitat and their populations typically follow a cyclical pattern that exhibits highs and lows at approximately 10-year intervals (Fitzgerald et al. 2011).

Furbearers

Furbearers likely to occur within the wildlife analysis area include beaver, muskrat, raccoon, striped skunk, long-tailed weasel, short-tailed weasel, badger, bobcat, coyote, mink, and red fox (BLM 2008; CDOW 2010; UDWR 2010). These species have wide distributions within the wildlife analysis area and are found within a variety of habitat types (e.g., sagebrush shrubland, desert shrub, pinyon-juniper, montane shrubland, grassland, etc.). The distribution of furbearers within the wildlife analysis area is typically determined by available food sources (e.g., small rodents, fish, insects, waste grain, human trash). The Canada lynx is listed as threatened, BLM sensitive and Utah state sensitive, and Colorado state endangered and is discussed in detail in Section 3.8, Special Status Wildlife Species.

Waterfowl

The wildlife analysis area is located within the Central and Pacific Flyways. Common waterfowl species that may occur within the wildlife analysis area include Canada goose, mallard, green-winged teal, northern pintail, gadwall, American widgeon, and common goldeneye. Other common summer residents include blue-winged teal, cinnamon teal, northern shoveler, redhead, ring-necked duck, and sandhill crane

(Cerovski et al. 2004; Floyd et al. 2007; Kingery 1998; Stokes and Stokes 1996). These species distributions are limited to the rivers, streams, lakes, reservoirs, ponds, and wetlands found within the wildlife analysis area. Population numbers for these species vary annually, based on available habitat and weather patterns. While waterfowl species are considered game birds, they also are protected under the MBTA.

3.7.4.3 Nongame Species

A diversity of nongame species (e.g., small mammals, raptors, passerines, and reptiles) occupies a variety of habitat types within the wildlife analysis area. Nongame species serve as predators, prey, and scavengers in ecosystems. Common nongame wildlife species include birds and small mammals such as bats, voles, chipmunks, gophers, woodrats, ground squirrels, and mice. These species provide a substantial prey base for predators within the wildlife analysis area including larger mammals (coyote, badger, bobcat), raptors (eagles, hawks, falcons, owls), and reptiles (snakes). Nongame small mammals that are further classified as sensitive are discussed in Section 3.8, Special Status Wildlife Species. A number of bat species also occurs within the wildlife analysis area (Bradley et al. 2006; Cerovski et al. 2004; Fitzgerald et al. 2011; Oliver 2000; WGFD 2010) and, with the exception of little brown myotis, these species are state protected, BLM sensitive, or USFS sensitive and are discussed in Section 3.8, Special Status Wildlife Species.

Raptors and Other Migratory Birds

Nongame birds encompass a variety of passerine and raptor species, including migratory bird species that are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-711) and Executive Order (EO) 13186 (66 FR 3853). In addition, bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Pursuant to EO 13186, both the BLM and USFS have signed MOUs with the USFWS that outline a collaborative approach to promote the conservation of migratory bird populations. The purpose of the MOUs is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds in coordination with state, tribal, and local governments. These MOUs identify specific activities where cooperation between the BLM, USFS, and USFWS would contribute to the conservation of migratory birds and their habitat. Specific activities outlined in the MOUs include but are not limited to:

- Follow the USFWS Bald Eagle Management Guidelines as appropriate;
- Follow migratory bird conservation measures as they are developed by the USFWS;
- Work collaboratively to identify and address issues affecting migratory bird Species of Concern;
- Evaluate the effects of proposed project actions on migratory birds during the NEPA process.

In order to comply with all applicable regulatory requirements outlined by the EO 13186 and the associated MOUs, TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this EIS, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Raptor species that could potentially occur as residents or migrants within the wildlife analysis area include eagles (bald and golden eagles), buteos (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk), falcons (e.g., prairie falcon, peregrine falcon, American kestrel), accipiters (e.g., northern goshawk, Cooper's hawk, sharp-shinned hawk), owls (e.g., great-horned owl, burrowing owl, long-eared owl, short-eared owl, flammulated owl), northern harrier, and osprey (Floyd et al. 2007; Herron et al. 1985;

Kingery 1998; Stokes and Stokes 1996; WGFD 2008). Special status raptor species are discussed in Section 3.8, Special Status Wildlife Species.

A variety of migratory birds occur within the wildlife analysis area throughout the year; however, they are most abundant during migration, as well as during the breeding season. Migratory bird breeding season for the wildlife analysis area generally is January 1 to August 15, depending on latitude and elevation, as well as seasonal weather conditions (Floyd et al. 2007; Kingery 1998; Nicholoff 2003). Representative bird species that occur throughout the wildlife analysis area include great blue heron, horned lark, barn swallow, black-billed magpie, common raven, western meadowlark, green-tailed towhee, American goldfinch, and red-winged blackbird (Floyd et al. 2007; Kingery 1998; Stokes and Stokes 1996; WGFD 2008). Migratory bird species that are further classified as federally-listed, candidate, state-listed, BLM sensitive, or USFS sensitive are discussed in Section 3.8, Special Status Wildlife Species.

USFWS Birds of Conservation Concern

A list of Birds of Conservation Concern (BCC) was developed as a result of a 1988 amendment to the Fish and Wildlife Conservation Act. This Act mandated that the USFWS "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." The goal of the BCC list is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions, and that these species would be consulted on in accordance with EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (USFWS 2008).

The wildlife analysis area is located within Bird Conservation Regions (BCR) 9 (Great Basin), 10 (Northern Rockies), 16 (Southern Rockies/Colorado Plateau), and 33 (Sonoran and Mohave Deserts). These BCR regions contain a wide variety of habitats from high elevation coniferous forests and alpine tundra to low elevation desert and sagebrush shrublands. Due to this habitat diversity, a large number of migratory birds are found year-round or during migration within these regions. The wildlife analysis area falls within a major migration corridor for bird species, which travel to and from western Canada through the U.S. to Mexico and Central and South America (USFWS 2008).

Within each BCR, BHCAs are specifically identified. BHCAs are grouped into three categories of priority, A, B and C, as defined below. Three criteria were used to rank these habitat areas: 1) statewide importance to birds; 2) degree of threat; and 3) opportunities (funding, partnerships, and feasibility for habitat protection, restoration, and enhancement). The three habitat categories were defined as:

- Priority A: High threat, high opportunity, and/or high value to birds statewide
- Priority B: One criterion may be high; generally the habitat is of moderate concern
- Priority C: Relatively low threat, low opportunity, and/or low value as habitat statewide

BHCAs have no official status, but are important as areas where state partners believe the best opportunity exists for effective conservation activities (IMJV 2005). Potential temporary and long-term impacts to BHCAs can result in lost opportunities for conservation efforts. In order to address this loss of conservation opportunity, BHCAs will be identified in the TWE Avian Protection Plan and prioritized as areas for potential compensatory mitigation. A total of 7 BHCAs are crossed by the 250-foot-wide transmission line ROW for all alternatives. A total of 26 BHCAs are crossed by the 2-mile transmission line corridor for all alternatives. A total of 47 BHCAs are partially or completely within the wildlife analysis area. BHCAs that are crossed by the 250 foot-wide transmission line ROW and examples of BCC species that may be found within them are presented in Section 3.7.5, Regional Summary, and on **Figure 3.7-1**.

Partners in Flight Priority Bird Species

The national Partners in Flight (PIF) program began in 1989 as a coordinated effort to document and reverse apparent population declines for neotropical migratory birds that breed north of Mexico and then

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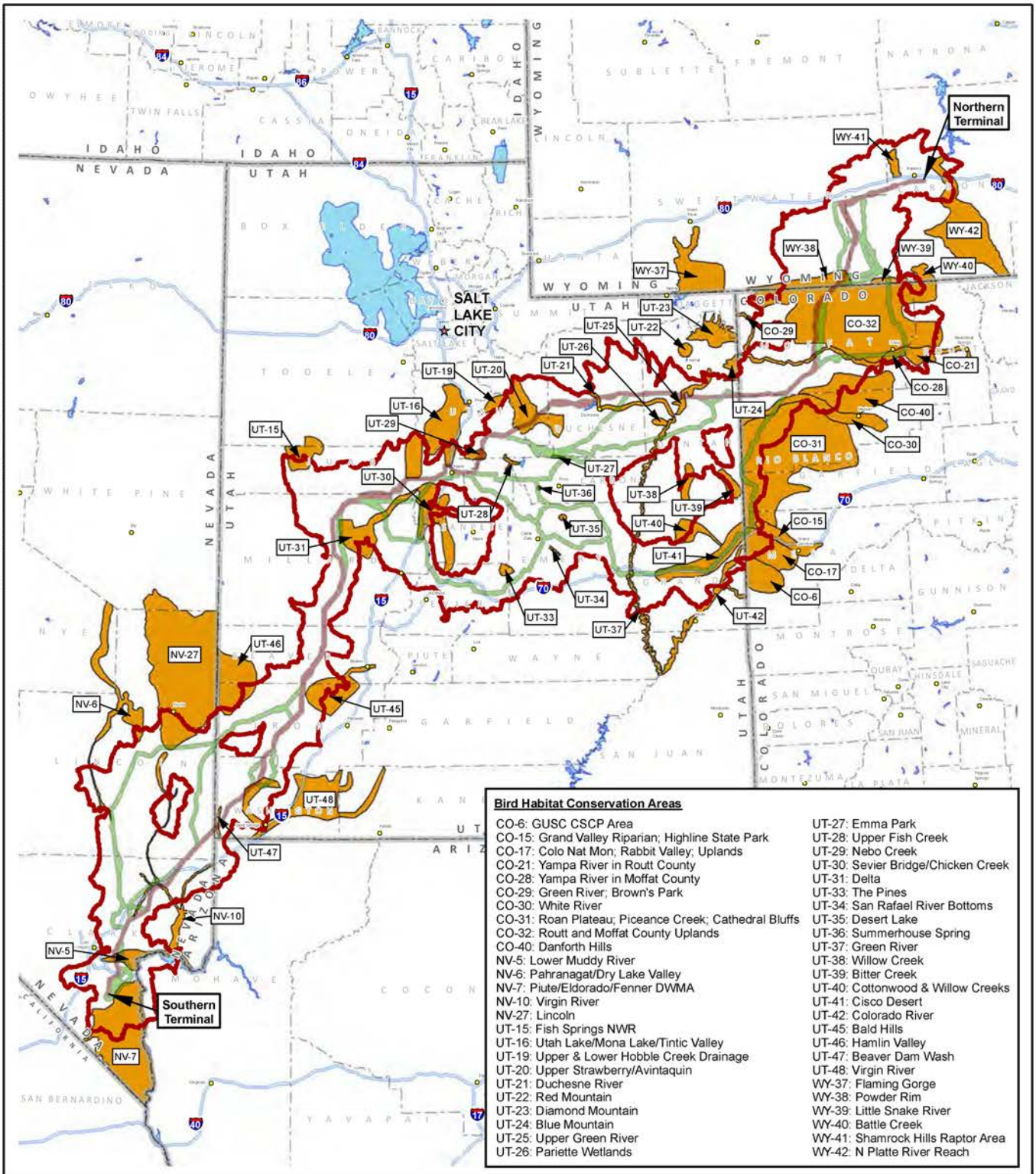

Bird Habitat Conservation Areas

CO-6: GUSC CSCP Area
CO-15: Grand Valley Riparian; Highline State Park
CO-17: Colo Nat Mon; Rabbit Valley; Uplands
CO-21: Yampa River in Routt County
CO-28: Yampa River in Moffat County
CO-29: Green River; Brown's Park
CO-30: White River
CO-31: Roan Plateau; Piceance Creek; Cathedral Bluffs
CO-32: Routt and Moffat County Uplands
CO-40: Danforth Hills
NV-5: Lower Muddy River
NV-6: Pahranagat/Dry Lake Valley
NV-7: Piute/Eldorado/Fenner DWMA
NV-10: Virgin River
NV-27: Lincoln
UT-15: Fish Springs NWR
UT-16: Utah Lake/Mona Lake/Tintic Valley
UT-19: Upper & Lower Hobble Creek Drainage
UT-20: Upper Strawberry/Avintaquin
UT-21: Duchesne River
UT-22: Red Mountain
UT-23: Diamond Mountain
UT-24: Blue Mountain
UT-25: Upper Green River
UT-26: Pariette Wetlands
UT-27: Emma Park
UT-28: Upper Fish Creek
UT-29: Nebo Creek
UT-30: Sevier Bridge/Chicken Creek
UT-31: Delta
UT-33: The Pines
UT-34: San Rafael River Bottoms
UT-35: Desert Lake
UT-36: Summerhouse Spring
UT-37: Green River
UT-38: Willow Creek
UT-39: Bitter Creek
UT-40: Cottonwood & Willow Creeks
UT-41: Cisco Desert
UT-42: Colorado River
UT-45: Bald Hills
UT-46: Hamlin Valley
UT-47: Beaver Dam Wash
UT-48: Virgin River
WY-37: Flaming Gorge
WY-38: Powder Rim
WY-39: Little Snake River
WY-40: Battle Creek
WY-41: Shamrock Hills Raptor Area
WY-42: N Platte River Reach

Project Corridors

- Applicant Proposed
- Alternative
- Project Analysis Area
- Bird Habitat Conservation Area (BHCA)

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.7-1
Bird Habitat Conservation Areas (BHCA)

0 20 40 80 Miles
0 20 40 80 km
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Western AREA POWER ADMINISTRATION

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migrate to Mexico, Central and South America, and the Caribbean in the winter months (Colorado Partners in Flight 2000; Neel 1999; Nicholoff 2003; Utah Steering Committee Intermountain West Joint Venture 2005). Examples of PIF Priority Bird Species that may be found within the wildlife analysis area in each Project region are presented in Section 3.7.5, Regional Summary.

Audubon Important Bird Areas

The Important Bird Areas (IBAs) program was initiated by BirdLife International in Europe in the 1980s. Since then, over 8,000 sites in 178 countries have been identified as Important Bird Areas. As the U.S. Partner of BirdLife International, the National Audubon Society administers the IBA Program in the U.S. Audubon launched its IBA initiative in 1995. State-based IBA programs provide the flexibility to tailor the program to individual state needs (National Audubon Society 2011).

IBAs are sites that provide essential habitat for one or more species of birds. They include sites for breeding, wintering, and/or migrating birds. IBAs may be a few acres or thousands of acres, but usually are discrete sites that stand out from the surrounding landscape. IBAs may include public or private lands, or both, and they may be protected by local, state, or national regulations (National Audubon Society 2011).

To qualify as an Important Bird Area, sites must satisfy at least one of the following criteria. The site must support:

- Species of conservation concern (e.g. threatened and endangered species);
- Restricted-range species (species vulnerable because they are not widely distributed);
- Species that are vulnerable because their populations are concentrated in one general habitat type or biome; or
- Species, or groups of similar species (such as waterfowl or shorebirds), that are vulnerable because they occur at high densities due to their behavior and habitat requirements.

A summary of IBAs that are within the wildlife analysis area in each Project region are presented in Section 3.7.5, Regional Summary. **Figure 3.7-2** displays IBAs within the wildlife analysis area.

Reptiles

Potential habitat for reptiles within the wildlife analysis area includes nearly all of the vegetative communities present, with the exception of high elevation coniferous forests and tundra. Species that could potentially occur within the wildlife analysis area include the desert horned lizard; Great Basin collared lizard, northern sagebrush lizard, bull snake, and prairie rattlesnake (Baxter and Stone 1980; Hammerson 1999; NDOW 2012). Sensitive reptile species are discussed in Section 3.8, Special Status Wildlife Species.

USFS Management Indicator Species

A Management Indicator Species (MIS) is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that their status and trend provide insights to the integrity of the larger ecological system to which they belong. Wildlife species that have been selected as MIS for the national forests crossed by the project are presented in **Table 3.7-4**. Seven MIS also are categorized as special status species and are presented in Section 3.8, Special Status Wildlife Species. Mule deer and Rocky Mountain elk are analyzed as big game species.

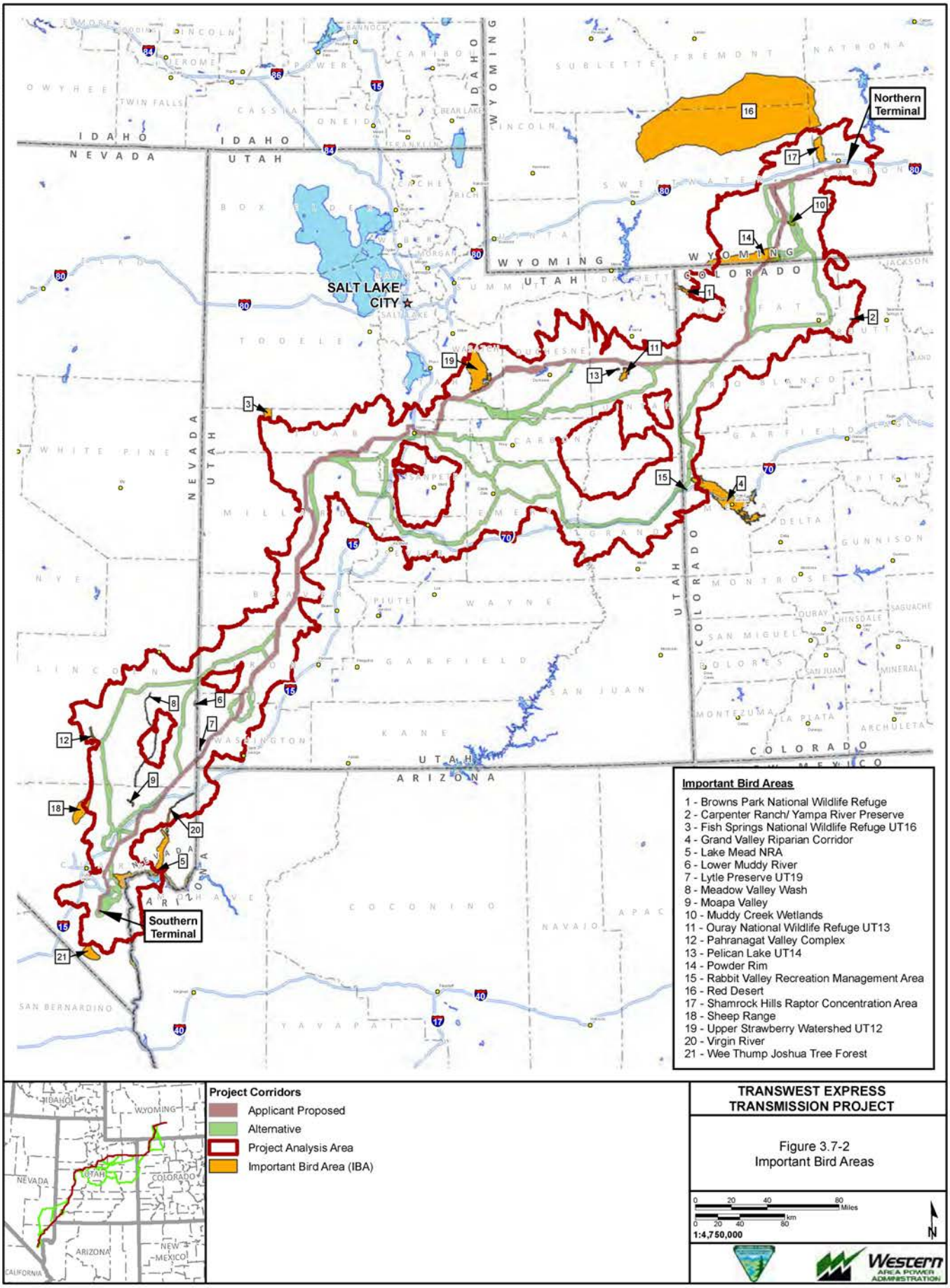
Northern Terminal
Southern Terminal
SALT LAKE CITY
IDAHO
NEVADA
UTAH
WYOMING
COLORADO
ARIZONA
Important Bird Areas
1 - Browns Park National Wildlife Refuge
2 - Carpenter Ranch/ Yampa River Preserve
3 - Fish Springs National Wildlife Refuge UT16
4 - Grand Valley Riparian Corridor
5 - Lake Mead NRA
6 - Lower Muddy River
7 - Lytle Preserve UT19
8 - Meadow Valley Wash
9 - Moapa Valley
10 - Muddy Creek Wetlands
11 - Ouray National Wildlife Refuge UT13
12 - Pahranagat Valley Complex
13 - Pelican Lake UT14
14 - Powder Rim
15 - Rabbit Valley Recreation Management Area
16 - Red Desert
17 - Shamrock Hills Raptor Concentration Area
18 - Sheep Range
19 - Upper Strawberry Watershed UT12
20 - Virgin River
21 - Wee Thump Joshua Tree Forest
Project Corridors
Applicant Proposed
Alternative
Project Analysis Area
Important Bird Area (IBA)
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.7-2
Important Bird Areas
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Table 3.7-4 USFS Management Indicator Species for National Forests Crossed by the 2-mile Transmission Line Corridor

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-LaSal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Mammals						
American beaver Habitat category: 15, 21	*Castor Canadensis*					MIS
Mule deer Refer to Section 3.7.4.1	*Odocoileus hemionus*	MIS	MIS	MIS	MIS, Big Game	
Elk Refer to Section 3.7.4.1	*Cervus Canadensis*	MIS	MIS	MIS	MIS, Big Game	
Birds						
Northern goshawk Habitat category: 2, 5, 6	*Accipiter gentilis*	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I
Golden eagle Habitat category: 1, 4, 7, 10, 13, 14, 16, 18, 19, 20	*Aquila chrysaetos*	MIS, BLM			MIS, BLM	
Greater sage-grouse Habitat category: 18	*Centrocercus urophasianus*	MIS, FC, BLM, USFS, UT-SS Tier I				
White-tailed ptarmigan Habitat category: 20	*Lagopus leucura*	MIS				
Wild turkey Habitat category: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	*Meleagris gallopavo*		MIS			
Red-naped sapsucker Habitat category: 2, 5, 6, 21	*Sphyrapicus nuchalis*	MIS, BLM				
Hairy woodpecker Habitat category: 1, 2, 6, 16, 21	*Picoides villosus*			MIS		
American three-toed woodpecker Habitat category: 5	*Picoides dorsalis*					MIS, BLM, USFS, UT-SS Tier II
Northern flicker Habitat category: 1, 2, 5, 6, 12, 16, 21	*Colaptes auratus*		MIS			
Warbling vireo Habitat category: 2, 16, 21	*Vireo gilvus*	MIS				
Western bluebird Habitat category: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia Mexicana*			MIS		
Mountain bluebird Habitat category: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia currucoides*			MIS		
Sage thrasher Habitat category: 18	*Oreoscoptes montanus*			MIS, BLM		
Yellow warbler Habitat category: 2, 6, 16, 19, 21	*Dendroica petechia*			MIS		
MacGillivray's warbler Habitat category: 2, 6, 16, 19, 21	*Oporornis tolmiei*			MIS		
Brewer's sparrow Habitat category: 18	*Spizella breweri*			MIS		

Table 3.7-4 USFS Management Indicator Species for National Forests Crossed by the 2-mile Transmission Line Corridor

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-LaSal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Vesper sparrow Habitat category: 1, 10, 13, 18	*Pooecetes gramineus*			MIS, BLM		
Song sparrow Habitat category: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	*Melospiza melodia*	MIS		MIS		
Lincoln's sparrow Habitat category: 2, 12, 16, 19, 21	*Melospiza lincolnii*			MIS		

[1] Habitat association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Note: Status is defined as: BLM = BLM Sensitive, USFS = USFS Sensitive, UT-SS = Utah Sensitive Species (Tier I and Tier II species are defined in Utah's Comprehensive Wildlife Strategy, NV-P = Nevada State Protected.

3.7.5 Regional Summary

As described in Section 3.7.4, Baseline Description, a wide variety of wildlife habitats and species is found within the three analysis areas. Many of these species are found over a wide geographic area in various habitat types and elevations found within the analysis areas. As described in Section 3.5, Vegetation, 20 habitat types associated with vegetation communities are found within the analysis areas and each Project region has several dominant habitat types (**Table 3.5-2**). Developed/disturbed land is not considered to be typical wildlife habitat and is not included in impact analyses. Given the habitat types present in each Project region, wildlife species and habitats specific to each region are summarized below.

The highest number of wildlife species occurs in Region II, due to elevation variation and associated habitat diversity. The potential occurrence of special status wildlife species by Project region is discussed in detail in Section 3.8.5, Regional Summary of Special Status Wildlife Species.

3.7.5.1 Big Game Species

As described in Section 3.7.4, Baseline Description, seven big game species are known to occur within the big game analysis area. A summary of big game species and habitat occurrence by Project region, including the terminal locations is provided below. The highest number of big game species occurs in Regions I and II, due to elevation fluctuations and associated habitat diversity. **Table 3.7-5** presents big game habitat present at the terminal siting areas.

Table 3.7-5 Big Game Habitat within the Terminal Siting Areas

Terminal	State	Species	Habitat Type	Acres with the Terminal Siting Area
Northern Terminal	Wyoming	Mule Deer	Crucial Winter/Yearlong Range	3,334
Southern Terminal Located near IPP (Design Option 2)	Utah	Pronghorn	Yearlong Crucial Range	639
Southern Terminal Located near IPP (Design Option 3)	Utah	Pronghorn	Yearlong Crucial Range	639
Proposed Alternative Southern Terminal	Nevada	None	N/A	N/A
Alternate Southern Terminal	Nevada	None	N/A	N/A

<u>Northern Terminal</u>

Table 3.7-6 presents big game habitat present at the Northern Terminal siting area.

Table 3.7-6 Big Game Habitat within the Northern Terminal Siting Area

State	Species	Habitat Type	Acres within the Northern Terminal Siting Area
Wyoming	Mule Deer	Crucial Winter/Yearlong Range	3,334

Proposed Alternative Southern Terminal

The Proposed Alternative Southern Terminal and associated facilities are sited almost entirely within developed/disturbed areas. Developed/disturbed land is not considered to be typical wildlife habitat and is not included in impact analyses. Less than 1 percent of the Southern Terminal siting area is within the desert shrub community. No big game species are known to occupy the Southern Terminal siting area.

Alternate Southern Terminal

The Alternate Southern Terminal and associated facilities are sited almost entirely within developed/disturbed areas. Developed/disturbed land is not considered to be typical wildlife habitat and is not included in impact analyses. Less than 1 percent of the Alternate Southern Terminal siting area is within the desert shrub community. No big game species are known to occupy the Alternate Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

The Southern Terminal located near IPP (Design Option 2) siting area is located within pronghorn yearlong crucial range.

Southern Substation located near IPP (Design Option 3)

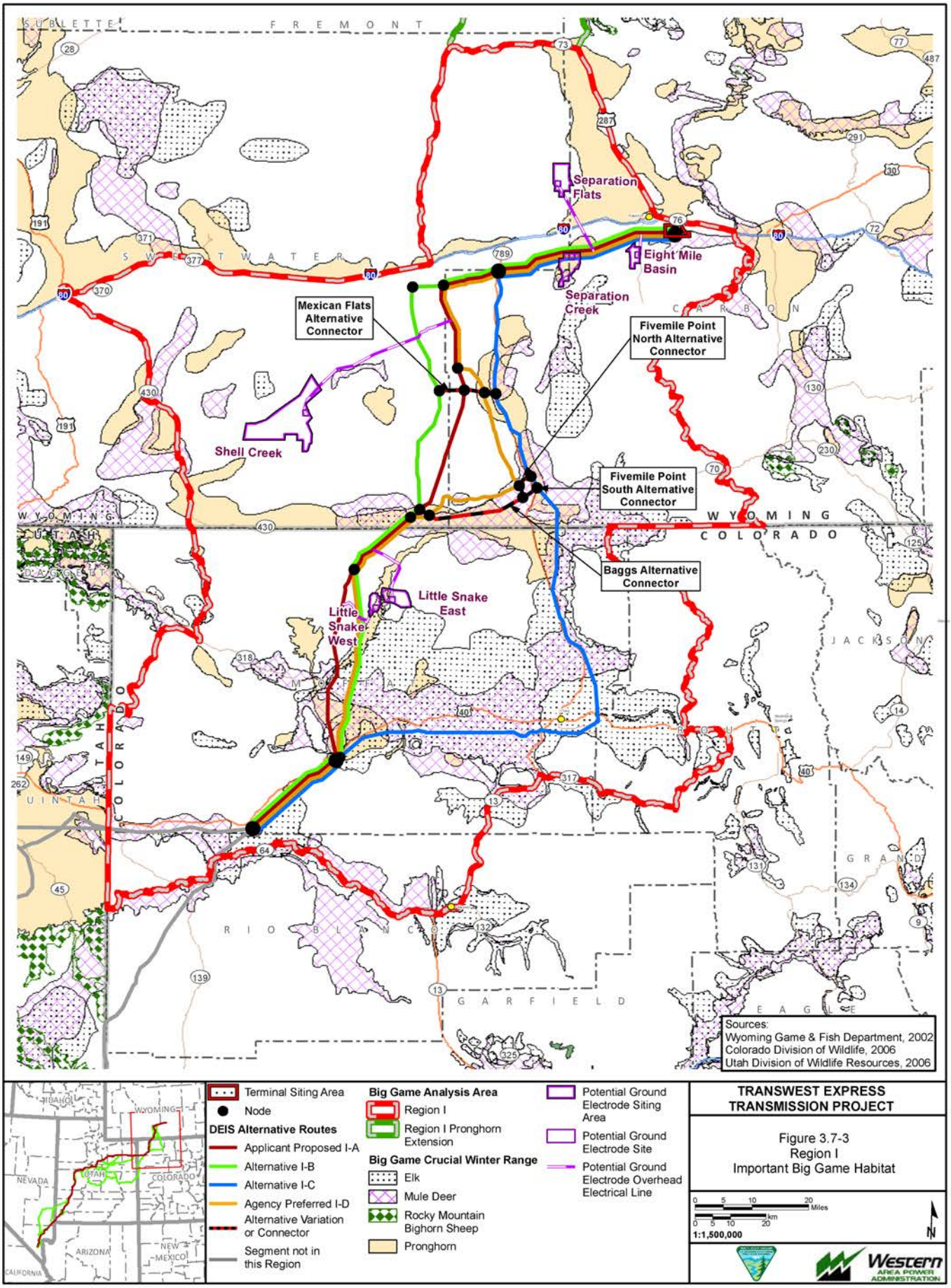
The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2). The Southern Substation would be located within pronghorn yearlong crucial range.

Region I

Species that occur within the Region I big game analysis area include pronghorn, mule deer, white-tailed deer, elk, moose, Rocky Mountain bighorn sheep, black bear, and mountain lion. Pronghorn, mule deer, and elk crucial winter range occurs within the big game analysis area throughout most of southern Wyoming, northwestern Colorado, and northeastern Utah. In addition, Rocky Mountain bighorn sheep crucial winter range occurs within the big game analysis area in northeastern Utah. Seasonal habitats within the Region I big game analysis area are presented in **Table 3.7-7** and on **Figure 3.7-3**.

Table 3.7-7 Habitat within the Big Game Analysis Area in Region I

State	Species	Habitat Type	Acres within Big Game Analysis Area
Wyoming	Pronghorn	Crucial Winter/Yearlong Range	485,710
	Mule Deer	Crucial Winter; Crucial Winter/ Yearlong Range	362,828
	Elk	Crucial Winter/Yearlong Range	206,076
Colorado	Pronghorn	Severe Winter Range	198,590
	Mule Deer	Severe Winter Range	677,309
	Elk	Severe Winter Range	1,016,686
	Elk	Parturition Range	370,140


Separation Flats
Eight Mile Basin
Separation Creek
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Shell Creek
Fivemile Point South Alternative Connector
Baggs Alternative Connector
Little Snake East
Little Snake West
WYOMING
COLORADO
UTAH
Sources:
Wyoming Game & Fish Department, 2002
Colorado Division of Wildlife, 2006
Utah Division of Wildlife Resources, 2006
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Big Game Analysis Area
Region I
Region I Pronghorn Extension
Big Game Crucial Winter Range
Elk
Mule Deer
Rocky Mountain Bighorn Sheep
Pronghorn
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.7-3
Region I
Important Big Game Habitat
1:1,500,000
Western AREA POWER ADMINISTRATION
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Region II

Species that occur within the Region II big game analysis area include pronghorn, mule deer, elk, moose, Rocky Mountain bighorn sheep, desert bighorn sheep, black bear, and mountain lion. Pronghorn, mule deer, and elk crucial winter ranges occur within the big game analysis area in portions of western Colorado and eastern and central Utah. Moose crucial winter range occurs within the big game analysis area in central Utah in Sanpete County. Rocky Mountain bighorn sheep crucial winter range occurs within the big game analysis area primarily along the I-70 corridor in Grand County and in southern Wasatch and Duchesne counties, Utah. Desert bighorn sheep crucial winter range occurs within the big game analysis area in Emery County, Utah. Big game seasonal habitats within the Region II big game analysis area are presented in **Table 3.7-8** and on **Figure 3.7-4**.

Table 3.7-8 Habitats within the Big Game Analysis Area in Region II

State	Species	Habitat Type	Acres within Big Game Analysis Area
Colorado	Pronghorn	Severe Winter Range	15,494
	Mule Deer	Severe Winter Range	179,527
	Elk	Severe Winter Range	106,056
	Elk	Parturition Range	22,548
Utah	Pronghorn	Crucial Yearlong; Substantial Yearlong Range	6,081,343
	Pronghorn	Parturition Range	1,428,978
	Mule Deer	Crucial Winter Range	3,486,734
	Mule Deer	Parturition Range	3,511,145
	Elk	Crucial Winter Range	3,329,852
	Elk	Parturition Range	1,624,494
	Moose	Occupied	1,319,143
	Moose	Parturition Range	393,186
	Rocky Mountain Bighorn Sheep	Crucial Yearlong Range	1,781,886
	Desert Bighorn Sheep	Occupied	1,103,697

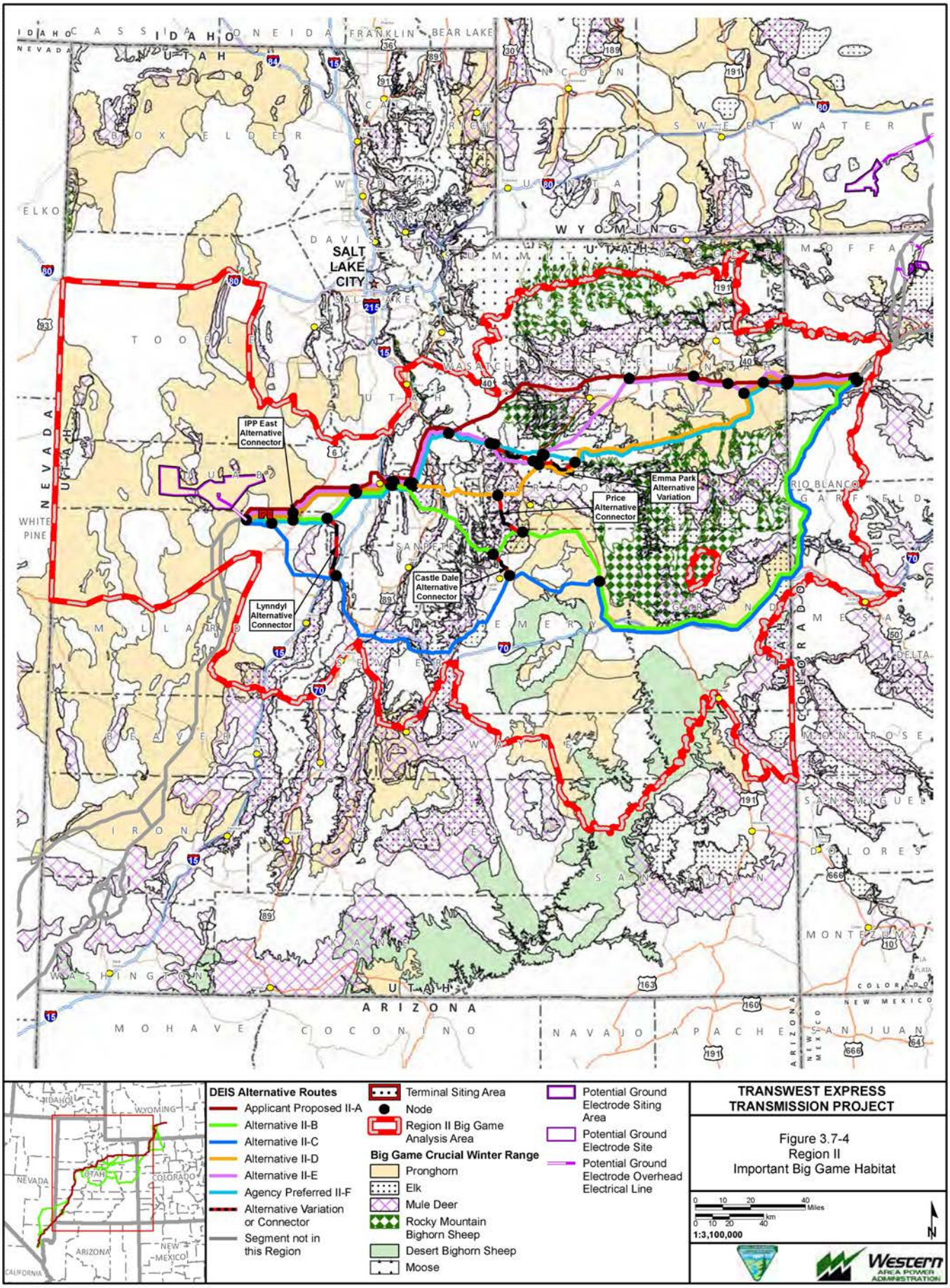
Region III

Species that occur within the Region III big game analysis area include pronghorn, mule deer, desert bighorn sheep, black bear, and mountain lion. Pronghorn and mule deer crucial winter range occurs within the big game analysis area throughout Region III in southwestern Utah and eastern Nevada. Desert bighorn sheep occupied habitat occurs within the big game analysis area in southern Nevada in Clark County. Big game seasonal habitats within the Region III big game analysis area are presented in **Table 3.7-9** and on **Figure 3.7-5**.

Table 3.7-9 Habitats within the Big Game Analysis Area in Region III

State	Species	Habitat Type	Acres within Big Game Analysis Area
Utah	Pronghorn	Crucial Yearlong Habitat	5,428,001
	Mule Deer	Crucial Winter Habitat	812,705
	Desert Bighorn Sheep	Occupied	67,786
Nevada	Pronghorn	Occupied	1,512,355
	Mule Deer	Occupied	250,417
	Desert Bighorn Sheep	Occupied[1]	564,735

[1] NDOW classifies desert bighorn sheep habitat as occupied, unoccupied, and potential habitat.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UTAH
NEVADA
WYOMING
ARIZONA
COLORADO
NEW MEXICO
SALT LAKE CITY
IPP East Alternative Connector
Lynndyl Alternative Connector
Castle Dale Alternative Connector
Price Alternative Connector
Emma Park Alternative Variation
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
Terminal Siting Area
Node
Region II Big Game Analysis Area
Big Game Crucial Winter Range
Pronghorn
Elk
Mule Deer
Rocky Mountain Bighorn Sheep
Desert Bighorn Sheep
Moose
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.7-4
Region II
Important Big Game Habitat
1:3,100,000
Western AREA POWER ADMINISTRATION
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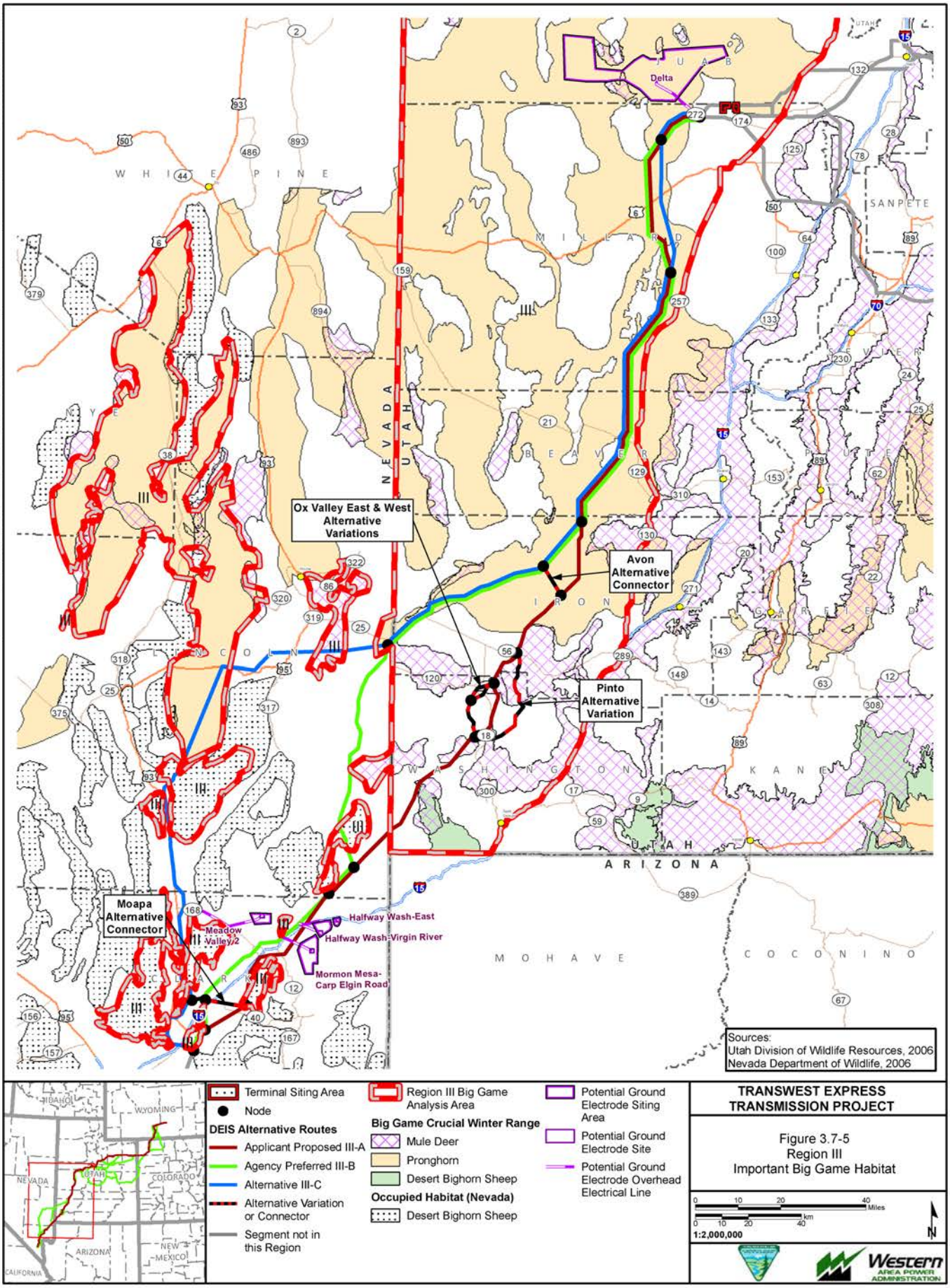

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Region IV

Species that occur within the Region IV big game analysis area include desert bighorn sheep and mountain lion. Desert bighorn sheep occupied habitat occurs within the big game analysis area in the mountain ranges surrounding Las Vegas, Nevada. Desert bighorn sheep habitat within the Region IV big game analysis area is presented in **Table 3.7-10** and on **Figure 3.7-6**.

Table 3.7-10 Habitat within the Big Game Analysis Area in Region IV

State	Species	Habitat Type	Acres within Big Game Analysis Area
Nevada	Desert Bighorn Sheep	Occupied[1]	257,657

[1] NDOW classifies desert bighorn sheep habitat as occupied, unoccupied, and potential habitat.

3.7.5.2 Small Game Species

As described in Section 3.7.4, Baseline Description, numerous small game species are known to occur within the wildlife analysis area. A summary of small game species occurrence for the terminal siting areas and by Project region is provided below. The highest number of small game species occurs within the wildlife analysis area in Regions I and II due to topography and associated habitat diversity.

Northern Terminal

Representative small game species that may occur within the Northern Terminal siting area include upland game birds such as mourning dove; small game mammals such as desert cottontail, black-tailed jackrabbit, and white-tailed jackrabbit; furbearers such as badger, bobcat, and coyote; and waterfowl such as mallard, Canada goose, blue-winged teal, and pintail.

Proposed Alternative Southern Terminal

Representative small game species that may occur within the proposed alternative Southern Terminal siting area include upland game birds such as Gambel's quail, chukar, and mourning dove; small game mammals such as desert cottontail; furbearers such as raccoon and coyote; and waterfowl such as mallard, Canada goose, green-winged teal, gadwall, and pintail.

Alternate Southern Terminal

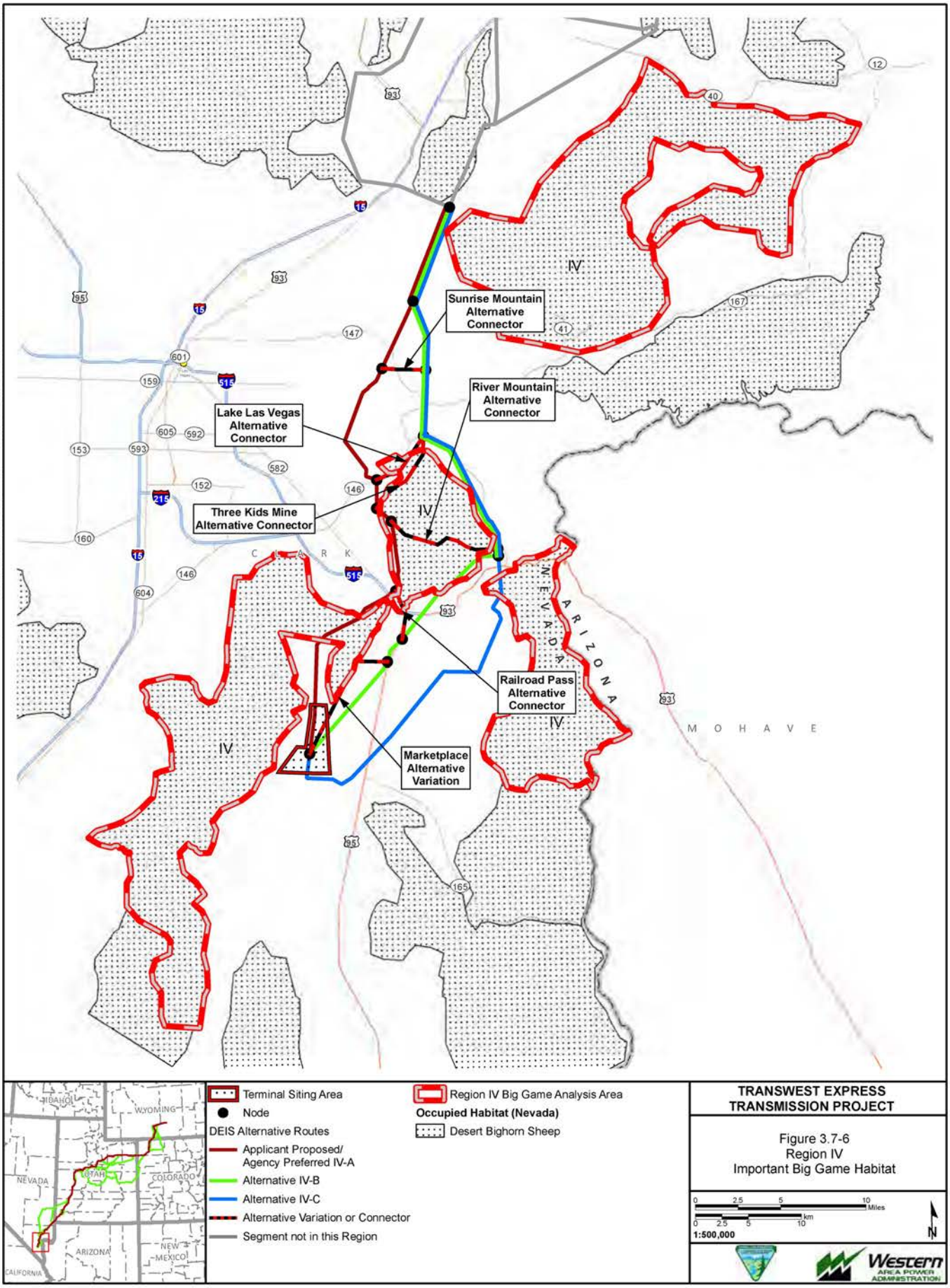
Representative small game species that may occur within the Alternate Southern Terminal siting area would be the same as for the proposed alternative Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

Representative small game species that may occur within the Southern Terminal located near IPP (Design Option 2) siting area include upland game birds such as dusky grouse, ruffed grouse, chukar, ring-necked pheasant, wild turkey, Gambel's quail, California quail, band-tailed pigeon, and mourning dove; small game mammals such as desert cottontail and white-tailed jackrabbit, furbearers such as bobcat, red fox, and coyote and waterfowl such as mallard, Canada goose, cinnamon teal, northern shoveler, and pintail.

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2) and representative small game species would be the same.



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Region I

Representative small game species that may occur within the Region I wildlife analysis area include upland game birds such as dusky grouse, ruffed grouse, and mourning dove; small game mammals such as desert cottontail, black-tailed jackrabbit, and white-tailed jackrabbit; furbearers such as beaver, badger, bobcat, and coyote; and waterfowl such as mallard, Canada goose, blue-winged teal, and pintail. Region I is located within the Central Flyway in portions of Wyoming near Rawlins and the Pacific Flyway in southern Wyoming and northwestern Colorado. Due to the arid climate and limited water sources in Region I, waterfowl species are typically found in close relation to wetlands and riparian areas, such as Muddy Creek in Wyoming; the Little Snake and Yampa rivers in Colorado; and the Green River and its tributaries in northeastern Utah.

Region II

Representative small game species that may occur within the Region II wildlife analysis area include upland game birds such as dusky grouse, ruffed grouse, chukar, ring-necked pheasant, wild turkey, California quail, band-tailed pigeon, and mourning dove; small game mammals such as desert cottontail, snowshoe hare, furbearers such as beaver, muskrat, bobcat, red fox, and coyote; and waterfowl such as mallard, Canada goose, green-winged teal, gadwall, and pintail. Region II is located within the Pacific Flyway. The Ouray National Wildlife Refuge (NWR) is located in the wildlife analysis area near the Green River in Uintah County, Utah. The Ouray NWR area provides important habitat during migration for waterfowl that migrate along the Green River riparian corridor in eastern Utah (USFWS 2011). The White River and Douglas Creek also provide habitat for small game species and waterfowl.

Region III

Representative small game species that may occur within the Region III wildlife analysis area include upland game birds such as dusky grouse, chukar, wild turkey, California quail, Gambel's quail, band-tailed pigeon, and mourning dove; small game mammals such as desert cottontail and white-tailed jackrabbit; furbearers such as badger, bobcat, red fox, and coyote; and waterfowl such as mallard, Canada goose, cinnamon teal, northern shoveler, and pintail. Region III is located within the Pacific Flyway. Due to the arid climate and limited water sources in Region III, small game species are typically found in close relation to wetlands and riparian areas such as streams and lakes in the Dixie National Forest in Washington County, Utah and along the Muddy River in Clark County, Nevada.

Region IV

Representative small game species that may occur within the Region IV wildlife analysis area include upland game birds such as Gambel's quail, chukar, and mourning dove; small game mammals such as desert cottontail; furbearers such as raccoon and coyote; and waterfowl such as mallard, Canada goose, pintail, and northern shoveler. Region IV is located with the Pacific Flyway. Due to a lack of water sources and riparian and wetland habitats within the Region IV wildlife analysis area, most waterfowl use is limited to migrating individuals that utilize the Lake Mead National Recreation Area in eastern Clark County, Nevada.

3.7.5.3 Nongame Species

As described in Section 3.7.4, Baseline Description, numerous nongame species are known to occur within the wildlife analysis area. A summary of nongame species occurrence for the terminal siting areas and by Project region is provided below. The highest number of nongame species occurs within the wildlife analysis area in Regions I and II due to topography and associated habitat diversity.

Northern Terminal

Small Mammals

Representative nongame small mammal species that may be found within the Northern Terminal siting area include little brown myotis, Merriam's shrew, golden-mantled ground squirrel, least chipmunk, northern pocket gopher, Ord's kangaroo rat, white-tailed prairie dog, Wyoming ground squirrel, Wyoming pocket gopher, and olive-backed pocket mouse (Fitzgerald et al. 2011).

Raptors

Based on agency raptor nest data, three species of raptors have been documented nesting within 1 mile of the Northern Terminal siting area. These include burrowing owl, golden eagle, and prairie falcon. As special status raptor species, these are addressed in Section 3.8.4.3, Region I.

Other Migratory Birds

A wide variety of migratory bird species may be found within the Northern Terminal siting area. Representative species include horned lark, western flycatcher, lark sparrow, and American goldfinch.

Reptiles

Representative reptile species that may be found within the Northern Terminal siting area include sagebrush lizard, short-horned lizard, Great Basin gopher snake, bull snake, wandering garter snake, and prairie rattlesnake (Baxter and Stone 1980; Hammerson 1999).

Proposed Alternative Southern Terminal

Small Mammals

Representative nongame small mammal species that may be found within the Proposed Alternative Southern Terminal siting area include little brown myotis, desert shrew, white-tailed antelope squirrel, Botta's pocket gopher, brush mouse, and canyon mouse (Hall 1995).

Raptors

No raptor nests are known to occur within 1 mile of the Proposed Alternative Southern Terminal siting area.

Other Migratory Birds

Representative migratory bird species that may be found at the Proposed Alternative Southern Terminal siting area include rock wren, black-tailed gnatcatcher, black-throated sparrow, and verdin.

Reptiles

Representative reptile species that may be found within the Proposed Alternative Southern Terminal siting area include western fence lizard, common side-blotched lizard, and western rattlesnake (SDNHM 2011).

Alternate Southern Terminal

Representative nongame species that may occur within the Alternate Southern Terminal siting area would be the same as for the Proposed Alternative Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

Small Mammals

Representative nongame small mammal species that may be found within the Southern Terminal located near IPP (Design Option 2) include little brown myotis, white-tailed antelope squirrel, northern pocket gopher, Ord's kangaroo rat, and plains pocket mouse (Fitzgerald et al. 2011).

Raptors

No raptor nests are known to occur within 1 mile of the Southern Terminal located near IPP (Design Option 2) siting area.

Other Migratory Birds

Representative migratory bird species that may be found at the Southern Terminal located near IPP (Design Option 3) siting area include western kingbird, dark-eyed junco, white-crowned sparrow, black-billed magpie, and cliff swallow.

Reptiles

Representative reptile species that may be found within the Region II wildlife analysis area include sagebrush lizard, short-horned lizard, rubber boa, bull snake, wandering garter snake, and western rattlesnake (Hammerson 1999; UDWR 2005).

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2) and representative nongame species would be the same.

USFS Management Indicator Species

Terminal siting areas are not within National Forests; therefore, no MIS are addressed for those locations.

Audubon IBAs and USFWS BHCAs

Terminal siting areas are not within Audubon IBAs or USFWS BHCAs.

Region I

Small Mammals

The primary habitat type in Region I consists of sagebrush shrubland. Representative nongame small mammal species that may be found within the Region I wildlife analysis area include little brown myotis, Merriam's shrew, golden-mantled ground squirrel, least chipmunk, northern pocket gopher, Ord's kangaroo rat, white-tailed prairie dog, Wyoming ground squirrel, Wyoming pocket gopher, and olive-backed pocket mouse (Fitzgerald et al. 2011).

Raptors

The Region I wildlife analysis area encompasses a wide variety of habitats (e.g., sagebrush shrubland, saltbush shrubland, grassland, etc.) for breeding and foraging raptor species (Johnsgard 1990; Kingery 1998). Based on agency raptor nest data, six species of raptors that are not classified as special status have been documented nesting within the Region I wildlife analysis area. These include northern harrier, Cooper's hawk, red-tailed hawk, American kestrel, great horned owl, and common raven (**Table 3.7-11**). Common ravens are not considered raptors, but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize historic raven nests. Special status raptor species that occur in Region I are addressed in Section 3.8.4.3, Region I.

Table 3.7-11 Non-Special Status Raptor Species Known to Nest in Region I

Species	Habitat Association[1]
Northern harrier	1, 10, 11, 12, 13, 17, 21
Cooper's hawk	1, 2, 5, 6, 17, 21
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21

Table 3.7-11 Non-Special Status Raptor Species Known to Nest in Region I

Species	Habitat Association[1]
American kestrel	1, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Great horned Owl	1, 2, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Common raven	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

In addition to the common migratory bird species presented in Section 3.7.4, Baseline Description, a wide variety of migratory bird species may occur in the various habitat types found in Region I. Details regarding BCC regions, BHCAs and associated species, PIF species, and Audubon IBAs are discussed below.

USFWS Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region I wildlife analysis area is located within USFWS Bird Conservation Regions 10 (Northern Rockies) and 16 (Southern Rockies/Colorado Plateau). **Table 3.7-12** presents the five BHCAs that are crossed by the 2-mile transmission line corridor in Region I and several representative bird species for each (Colorado PIF 2000, Nicholoff 2003; USFWS 2008; Wyoming Steering Committee IWJV 2005). Within Region I there are 16 BHCAs located within the wildlife analysis area, comprising a total of 5,507,769 acres.

Table 3.7-12 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region I Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
WY	10	38 – Powder Rim	• Sagebrush shrubland • Utah juniper	• Ash-throated flycatcher[3] • Plumbeous vireo[3]
WY	10	39 – Little Snake River	• Herbaceous wetland • Open water	• Cinnamon teal • Northern harrier[3] • Marsh wren[2]
CO	10/16	21 – Yampa River in Routt County	• Herbaceous wetland • Open water • Woody riparian and wetlands	• Bufflehead • Marsh wren[3] • Willow flycatcher • Veery[3] • Wilson's warbler
CO	10	28 - Yampa River in Moffat County	• Herbaceous wetland • Open water • Woody riparian and wetlands	• Northern harrier[3] • Cinnamon teal • Marsh wren[3]
CO	10	32 - Routt and Moffat County Uplands	• Sagebrush shrubland • Montane shrubland	• Greater sage-grouse[3] • Columbian sharp-tailed grouse[3] • Sage sparrow[3] • Brewer's sparrow[3]

1This is not an all-inclusive list of BCC and PIF species.

[2]Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3]Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

A total of eight Audubon Important Bird Areas are within the Region I wildlife analysis area.

Red Desert IBA – The Red Desert IBA is located 22.6 miles from the from the 2-mile transmission line corridor. The site consists of a 1,910,651 acre complex of IBA sites in Sweetwater County, Wyoming. The Red Desert IBA is also a Conservation Action Site for Audubon Wyoming's Sagebrush Initiative. The IBA encompasses a variety of habitats, including sagebrush/grasslands; shrub-steppe; springs and seeps; stands of limber pine and aspen with a deciduous shrub understory; seasonal wetlands; and seasonal ponds in spring. The site provides important habitat for sagebrush obligate species, such as greater sage-grouse, sage thrasher, sage sparrow, and Brewer's sparrow. Numerous other bird species inhabit the micro-habitats in the Red Desert IBA (National Audubon Society 2011).

Muddy Creek Wetlands IBA – The Muddy Creek Wetlands IBA is intersected by the 2-mile transmission line corridor in Carbon County, Wyoming. The IBA consists of a 7,205 acre site that encompasses 6 miles of riparian vegetation along Muddy Creek. Habitat at the site includes a willow-dominated riparian corridor with associated flood plain, meadows, and adjacent upland areas. Hundreds of species of waterbirds, shorebirds, and waterfowl from both the Pacific and Central flyways utilize the area for breeding and migration. The diversity of habitats provides an oasis for a large variety of bird species, such as white-faced ibis, snowy egrets, herons, grebes, warblers, and willow flycatchers. The wetlands support up to 50,000 ducks during migration and a host of breeding shorebirds, including American avocets and black-necked stilts (National Audubon Society 2011).

Brown's Park National Wildlife Refuge IBA – Brown's Park National Wildlife Refuge is located 2 miles from the 2-mile transmission line corridor in Moffat County, Colorado. The IBA consists of a 13,211-acre site along the Green River. The vegetation is characterized by riparian, wetland, grassland, semi-desert shrubland, and pinyon-juniper. The IBA provides important habitat for 222 bird species, especially breeding and migrating waterbirds, shorebirds, gulls, terns, and songbirds (National Audubon Society 2011).

Powder Rim IBA – The Powder Rim IBA is located 14 miles from the 2-mile transmission line corridor in Sweetwater County, Wyoming. The IBA consists of a 131,826 acre mosaic of juniper and big sagebrush. Because juniper habitat is limited in Wyoming, the bird community at Powder Rim IBA is unique and has significant conservation value. The juniper woodlands have been shown to support greater bird species diversity than the surrounding shrubland habitat. Powder Rim IBA is especially noted for juniper obligate species (National Audubon Society 2011).

Carpenter Ranch/Yampa River Preserve IBA - The Carpenter Ranch/Yampa River Preserve IBA is located 9.9 miles from the 2-mile transmission line corridor in Routt County, Colorado. The IBA consists of 1730 acres of riparian forest dominated by narrowleaf cottonwood, box elder, and red-osier dogwood. This type of riparian forest community is considered rare because it only occurs in a few locations in Colorado, Utah, and Wyoming. The Yampa River Preserve is located just upstream from the Carpenter Ranch and encompasses 824 acres of the same rare riparian forest community as the Carpenter Ranch (National Audubon Society 2011).

Pelican Lake IBA – Pelican Lake IBA is located 2 miles from the 2-mile transmission line corridor in Uintah County, Utah, and falls within both the Region I and Region II wildlife analysis areas. The IBA consists of a 1,056 acre complex of wetland areas, including a natural lake, which provides important winter habitat for large numbers of waterfowl, especially mallards. Bald eagles winter at this site. American white pelicans forage at Pelican Lake during much of the year (National Audubon Society 2011).

Ouray National Wildlife Refuge IBA – The Ouray National Wildlife Refuge IBA lies in the Uintah Basin located in Uintah County, Utah, and falls within both the Region I and Region II wildlife analysis areas. The

IBA is located 4.6 miles from the 2-mile transmission line corridor. The site consists of 20,890 acres and is considered to contain the most significant single stand of riparian cottonwood on the entire Green River and perhaps the entire Colorado River Drainage. Of the five priority habitats identified by the Utah Avian Conservation Strategy, the Ouray National Wildlife Refuge IBA contains three. The lowland riparian habitat supports broad-tailed hummingbird, yellow-billed cuckoo, and black-throated gray warbler. The wetland habitat supports nesting populations of American avocet, black-necked stilt, and American white pelican. The shrub/steppe habitat supports ferruginous hawks, greater sage-grouse, Brewer's sparrow, and sage sparrow (National Audubon Society 2011).

Shamrock Hills Raptor Concentration Area IBA – The Shamrock Hills Raptor Concentration Area IBA is located 2.7 miles from the 2-mile transmission line corridor in Carbon County, Wyoming. The IBA consists of 36,787 acres encompassing a variety of habitat types. Sagebrush and grasslands are the dominant vegetation communities. The area is known as one of the largest breeding grounds for ferruginous hawks in the western U.S. Other migratory birds known to utilize this IBA include golden eagle, burrowing owl, northern harrier, prairie falcon, American kestrel, great horned owl, and red-tailed hawk. Mountain plover are present in low numbers. Passerine species include lark bunting, sage sparrow, sage thrasher, Say's phoebe, and mountain bluebird (National Audubon Society 2011).

Reptiles

The primary habitat type in Region I consists of sagebrush shrubland. Representative reptile species that may be found within the Region I wildlife analysis area include sagebrush lizard, short-horned lizard, Great Basin gopher snake, bull snake, wandering garter snake, and prairie rattlesnake (Baxter and Stone 1980; Hammerson 1999).

USFS Management Indicator Species

No National Forests are crossed by the Project in Region I; therefore, no MIS are addressed in this section.

Region II

Small Mammals

The primary habitat types in Region II consist of sagebrush shrubland, saltbush shrubland, and pinyon-juniper. Representative nongame small mammal species that may be found within the wildlife analysis area in Region II include little brown myotis, masked shrew, white-tailed antelope squirrel, Uintah chipmunk, northern pocket gopher, Ord's kangaroo rat, and plains pocket mouse (Fitzgerald et al. 2011).

Raptors

The Region II wildlife analysis area encompasses a wide variety of habitats (e.g., agriculture, sagebrush shrubland, saltbush shrubland, pinyon-juniper, etc.) for breeding and foraging raptor species. Based on agency raptor nest data, six species of raptors that are not classified as special status have been documented nesting within the Region II wildlife analysis area. These include osprey, Cooper's hawk, red-tailed hawk, American kestrel, great horned owl, and common raven (**Table 3.7-13**). Common ravens are not considered raptors, but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize historic raven nests. Special status raptor species that occur in Region II are addressed in Section 3.8.4.4, Region II.

Table 3.7-13 Non-special Status Raptor Species Known to Nest in Region II

Species	Habitat Association[1]
Cooper's hawk	1, 2, 5, 6, 16, 17, 21
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21

Table 3.7-13 Non-special Status Raptor Species Known to Nest in Region II

Species	Habitat Association[1]
Osprey	15, 17, 21
American kestrel	1, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Great horned owl	1, 2, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Common raven	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

USFWS Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region II wildlife analysis area falls within USFWS Bird Conservation Regions 16 (Southern Rockies/Colorado Plateau and 9 (Great Basin). **Table 3.7-14** presents the 14 BHCAs found in the Region II wildlife analysis area and several representative bird species that have been observed utilizing these BHCAs (Colorado PIF 2000; Parrish et al. 2002; USFWS 2008; Utah Steering Committee IWJV 2005). There are 28 BHCAs located within the Region II wildlife analysis area, comprising a total of 4,823,358 acres.

Table 3.7-14 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region II Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
CO	16	17 – Colorado National Monument, Rabbit Valley, Uplands	• Sagebrush shrubland • Montane shrubland • Woody riparian and wetlands	• Lewis's woodpecker[3] • Brewer's sparrow[3] • Common poorwill[3] • Virginia's warbler[3]
CO	16	30 - White River	• Open water • Woody riparian and wetlands	• Barrow's goldeneye[3] • Veery[3] • Northern harrier[3] • Lewis's woodpecker[3]
CO	16	31 - Roan Plateau, Piceance Creek, Cathedral Bluffs	• Saltbush shrubland • Woody riparian and wetlands	• Gray vireo[3] • Long-eared owl • Black-throated gray warbler[3] • Piñon jay
UT	9	16 – Utah Lake, Mona Lake, Tintic Valley	• Open water • Herbaceous wetland • Woody riparian and wetlands • Sagebrush shrubland • Saltbush shrubland	• Greater sage-grouse[3] • Brewer's sparrow[3] • Cinnamon teal • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3] • American white pelican[3]
UT	16	36 – Summerhouse Spring	• Wetland and associated uplands	• Greater sage-grouse[3] • Common snipe
UT	16	27 - Emma Park	• Wet meadow	• Greater sage-grouse[3] • Common snipe • Long-billed curlew[3] • Shorebirds

Table 3.7-14 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region II Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
UT	16	20 – Strawberry Reservoir Watershed	• Open water • Woody riparian and wetlands • Montane shrubland	• Greater sage-grouse[3] • Brewer's sparrow3 • Sage sparrow[3] • Cinnamon teal
UT	16	21 - Duchesne River	• Open water • Herbaceous wetland • Woody riparian and wetlands • Saltbush shrubland	• Yellow-billed cuckoo (western)[3] • Bobolink[3] • American white pelican[3]
UT	16	25 - Upper Green River – Including: • Ouray National Wildlife Refuge • Pelican Lake • Stewart Lake Waterfowl Management Area • Pariette Wetlands	• Herbaceous wetland • Open water • Woody riparian and wetlands	• Yellow-billed cuckoo[3] • American white pelican[3] • Lewis's woodpecker[3] • Mountain plover[3]
UT	16	29 – Lower Nebo Creek Drainage	• Woody riparian and wetlands • Herbaceous wetland	• Lewis's woodpecker[3] • Cooper's hawk
UT	9	30 – Sevier Bridge, Chicken Creek Reservoirs	• Open water • Herbaceous wetland	• Cinnamon teal • Peregrine falcon • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3]
UT	9	31 - Delta	• Open water • Herbaceous wetland	• Cinnamon teal • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3]
UT	16	37 – Green River	• Woody riparian and wetlands • Herbaceous wetland • Open water	• Bald eagle • Virginia warbler[3] • Lucy's warbler[3] • Yellow-breasted chat • Blue grosbeak • Yellow-billed cuckoo (western)[3] • Mexican spotted owl[3]
UT	16	41 – Cisco Desert	• Desert shrub	• Bald eagle • Golden eagle • Ferruginous hawk[3] • Burrowing owl[3] • Long-billed curlew[2]

[1] Not an all inclusive list of BCC and PIF species.

[2] Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3] Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

A total of five Audubon Important Bird Areas are within the Region II wildlife analysis area.

Ouray National Wildlife Refuge IBA – The Ouray National Wildlife Refuge IBA lies in the Uintah Basin located in Uintah County, Utah, and falls within the Region I and Region II wildlife analysis areas. The IBA is located 4.6 miles from the 2-mile transmission line corridor. The site consists of 20,890 acres and is considered to contain the most significant single stand of riparian cottonwood on the entire Green River and perhaps the entire Colorado River Drainage. Of the five priority habitats identified by the Utah Avian Conservation Strategy, the Ouray National Wildlife Refuge IBA contains three. The lowland riparian habitat supports broad-tailed hummingbird, yellow-billed cuckoo, and black-throated gray warbler. The wetland habitat supports nesting populations of American avocet, black-necked stilt, and American white pelican. The shrubsteppe habitat supports ferruginous hawks, greater sage-grouse, Brewer's sparrow, and sage sparrow (National Audubon Society 2011).

Pelican Lake IBA – Pelican Lake IBA is located 2 miles from the 2-mile transmission line corridor in Uintah County, Utah, and falls within the Region I and Region II wildlife analysis areas. The IBA consists of a 1,056 acre complex of wetland areas, including a natural lake, which provides important winter habitat for large numbers of waterfowl, especially mallards. Bald eagles winter at this site. American white pelicans forage at Pelican Lake during much of the year (National Audubon Society 2011).

Rabbit Valley Recreation Management Area and IBA – Rabbit Valley Recreation Management Area IBA is located 3 miles from the 2-mile transmission line corridor in Mesa County, Colorado. The IBA consists of a 366 acre Recreation Management Area. The vegetation is characterized by pinyon-juniper -juniper and sagebrush in high desert terrain. A small portion of the site consists of lowland riparian habitat. Rabbit Valley Recreation Management Area IBA is especially noted as providing habitat for gray vireos and Scott's orioles (National Audubon Society 2011).

Upper Strawberry Watershed IBA – The Upper Strawberry Watershed IBA is located 11 miles from the 2-mile transmission line corridor in Wasatch County, Utah. The IBA consists of a 126,073 acre site with a wide variety of forested and non-forested habitats. The Upper Strawberry Reservoir Watershed IBA provides habitat for a wide variety of species. Over 120 bird species have been recorded at the site, including an estimated 500 greater sage-grouse, over 200 American white pelicans, and at least 10 pairs of nesting American three-toed woodpeckers. A nesting pair of bald eagles is also known to occur in the Strawberry Valley. Numerous neotropical migrants are known to nest or regularly occur in the Upper Strawberry Watershed IBA. These include Brewer's sparrow and broad-tailed hummingbird. Strawberry Reservoir provides significant habitat for Caspian terns (as high as 60). An estimated 1,200 western grebes and 100 Clark's grebes have been counted on Strawberry Reservoir. These numbers approximate 1 percent of the total North American population for these species (National Audubon Society 2011).

Grand Valley Riparian Corridor and Highline State Park IBA – The Grand Valley Riparian Corridor and Highline State Park IBA is located 7 miles from the 2-mile transmission line corridor in Mesa County, Colorado. This IBA consists of a 175,634 acre assemblage of areas along the Colorado River floodplain in the Grand Valley. The site contains much of Colorado's best remaining Rio Grande cottonwood habitat. The IBA provides nesting, wintering, and stopover habitat for approximately 75 percent of the state's bird species. Nearly 300 bird species have been recorded at this IBA, including nearly 70 breeding species and over 70 wintering species (National Audubon Society 2011).

USFS Management Indicator Species

Four National Forests would be crossed by the Project in Region II. Management Indicator Species for each of these forests are presented in **Table 3.7-4**.

Reptiles

The primary habitat types in Region II consist of sagebrush shrubland, saltbush shrubland, and pinyon-juniper woodland. Representative reptile species that may be found within the Region II wildlife analysis area include sagebrush lizard, short-horned lizard, rubber boa, bull snake, wandering garter snake, and western rattlesnake (Hammerson 1999; UDWR 2005).

Region III

Small Mammals

The Region III wildlife analysis area encompasses a wide variety of habitats for small mammals (e.g., sagebrush shrubland, grassland, desert shrubland); however, the primary habitat type is desert shrubland. Representative nongame small mammal species that may be found within the Region III wildlife analysis area include little brown myotis, Merriam's shrew, white-tailed antelope squirrel, cliff chipmunk, Botta's pocket gopher, Ord's kangaroo rat, and Great Basin pocket mouse (Hall 1995).

Raptors

The Region III wildlife analysis area encompasses a wide variety of habitats for breeding and foraging raptor species (e.g., sagebrush shrubland, grassland, desert shrubland); however, the primary habitat type is desert shrubland. Agency raptor nest data is limited within Region III but suspected nesting raptors that are not classified as special status include red-tailed hawk, osprey, and common raven (**Table 3.7-15**). Common ravens are not raptors, but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize historic raven nests. Special status raptor species that occur in Region III are addressed in Section 3.5.4.5, Region III.

Table 3.7-15 Non-Special Status Raptor Species Known to Nest in Region III

Species	Habitat Association[1]
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Osprey	15, 17, 21
Common raven	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region III wildlife analysis area falls within USFWS Bird Conservation Regions 9 (Great Basin), 16 (Southern Rockies/Colorado Plateau), and 33 (Sonoran and Mojave Deserts). **Table 3.7-16** presents the seven BHCAs in Region III that are crossed by the 2-mile transmission line corridor, and several representative bird species for each (Neel 1999; Parrish et al. 2002; USFWS 2008; Utah Steering Committee IWJV 2005). There are nine BHCAs located within the Region III wildlife analysis area, comprising a total of 3,422,193 acres.

Table 3.7-16 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region III Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
UT	9	31 - Delta	• Open water • Herbaceous wetland	• Cinnamon teal • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3]
UT	9	45 – Bald Hills	• Shrub-steppe	• Greater sage-grouse[3] • Ferruginous hawk[3] • Sage sparrow[3] • Brewer's sparrow[3]

Table 3.7-16 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region III Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
UT	9, 16	48 – Virgin River	• Open water • Woody riparian and wetlands	• Abert's towhee[3] • Lucy's warbler[3] • Bell's vireo[3] • Gray vireo[3] • Yellow-billed cuckoo (western)[3]
UT	33	47 – Beaver Dam and Wash	• Open water • Woody riparian and wetlands	• Black-tailed gnatcatcher[3] • Yellow-billed cuckoo (western)[3] • Lucy's warbler[3] • Bell's vireo[3]
NV	9	5- Lower Muddy River Complex/ Meadow Valley Wash	• Multi-aged tree stands with riparian shrub understory • Floodplain wetlands	• Yuma clapper rail • Southwestern willow flycatcher
NV	9	6- Pahranaghat/ Dry Lake Valley	• Cottonwood-willow riparian • Upland habitat	• Southwestern willow flycatcher • Yellow-billed cuckoo • Greater sandhill crane • Bald eagle • Golden eagle
NV	9	27- Lincoln Sage Grouse PMU	• Sagebrush	• Greater sage-grouse

[1] Not an all inclusive list of BCC and PIF species.

[2] Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3] Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

Nine Audubon Important Bird Areas are within the Region III wildlife analysis area.

Lytle Preserve IBA – The Lytle Preserve IBA located 1 mile from the 2-mile transmission line corridor in Washington County, Utah. The IBA consists of 525 acres of cottonwood riparian habitat within the Utah portion of the Mojave Desert. Over 200 bird species have been recorded on the preserve. Of particular note are Gambel's quail, Lucy's warbler, and Bell's vireo. The preserve also is a corridor for migrants, including flycatchers, warblers, and flammulated owls. Nesting species include Cooper's hawk, Costa's hummingbird, black-tailed gnatcatcher, white-winged dove, summer tanager, blue grosbeak, common black hawk, brown-crested flycatcher, vermillion flycatcher, and phainopepla (National Audubon Society 2011).

Moapa Valley IBA – The Moapa Valley IBA is located 6 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 2,404 acres of riparian habitat along the upper Virgin River. The site is located within a region of dry Mojave Desert scrub and mesquite, and provides significant riparian stopover habitat for migratory birds, including western yellow-billed cuckoo, sandhill crane, loggerhead shrike, Lucy's warbler, Crissal thrasher, and vermillion flycatcher (National Audubon Society 2011).

Virgin River IBA - The Virgin River IBA is located 8 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 15,454 acres encompassing considerable meanders of the Virgin River. The site is characterized by a variety of native riparian vegetation, including marshes and patches of

native willow. Depending on the water level of Lake Mead, a delta forms where the river flows into the lake. The Virgin River is the only intact river in the Mojave Desert of Nevada that still has meanders and is not influenced by dams. All of Nevada's endangered birds and many of the birds identified in the Lowland Riparian section of the Nevada Bird Conservation Plan occur at the Virgin River (National Audubon Society 2011).

Fish Springs National Wildlife Refuge IBA – The Fish Springs National Wildlife Refuge IBA is located 33 miles from the 2-mile transmission line corridor in Juab County, Utah. The IBA consists of 18,123 acres encompassing salt grass uplands, desert shrub, mudflats, and spring-fed saline marsh impoundments. The refuge provides 10,000 acres of critical wetlands habitat in a very arid desert region. Fish Springs National Wildlife Refuge IBA is the only significant wetland in over 50 miles. The refuge serves as a vital stopover point for migrating birds, with 275 bird species documented at the refuge. Unusual or rare birds utilizing the IBA include: blue grosbeak, varied thrush, summer tanager, phainopepla, Lucy's warbler, magnolia warbler, blackpoll warbler, black-and-white warbler, and American redstart (National Audubon Society 2011).

Lower Muddy River IBA – The Lower Muddy River IBA is located 4 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 2,646 acres, including the river and its flood plain from the Overton Wildlife Management Area to Lake Mead. The cottonwood riparian vegetation along this Colorado River tributary provides important habitat for a variety of bird species, including Yuma clapper rail, Virginia rail, southwestern willow flycatcher, western yellow-billed cuckoo, summer tanager, brown-crested flycatcher, black-tailed gnatcatcher, Crissal thrasher, verdin, and a variety of raptors and waterbirds (NDOW 2012).

Meadow Valley Wash IBA – The Meadow Valley Wash IBA is located 3 miles from the 2-mile transmission line corridor in Lincoln County, Nevada. The IBA consists of 15,056 acres of intermittent wetlands and seeps. The combination of a large area, north-south alignment, and wetland/water sites make this wash system a significant wildlife habitat and migration corridor for riparian and desert bird species. The IBA provides habitat for year-round residents, seasonal breeding birds, and migrants (National Audubon Society 2011).

Pahranagat Valley Complex IBA – The Pahranagat Valley Complex IBA is intersected by the 2-mile transmission line corridor in Lincoln County, Nevada. The IBA consists of 5,914 acres from the Pahranagat Valley National Wildlife Refuge and the Key-Pittman Wildlife Management Area. More than 230 different bird species utilize the Pahranagat National Wildlife Refuge. Bird abundance and diversity is highest during migration when large numbers of songbirds, waterfowl, shorebirds, and raptors converge. Willow thickets on the west side of Nesbitt Lake provide nesting sites for southwestern willow flycatchers and western yellow-billed cuckoos. Sandhill cranes utilize the IBA during migration (National Audubon Society 2011)

Sheep Range IBA – The Sheep Range IBA is located 6 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 59,917 acres in the arid mountains of southern Nevada. This area encompasses three different life zones and provides habitat diversity for many bird species. Small seeps and springs provide much needed water for birds. The site is noteworthy for flammulated owl, gray flycatcher, black-throated gray warbler, and Grace's warbler (National Audubon Society 2011).

Lake Mead National Recreation Area IBA – The Lake Mead National Recreation Area IBA is intersected by the 2-mile transmission line corridor in Clark County, Nevada and falls within the Regions III and IV wildlife analysis areas. The 152,860 acre IBA is part of the Lake Mead National Recreation Area. The area of the NRA recognized as an IBA is limited to Lake Mead and Lake Mohave above Davis Dam on the Colorado River, the adjacent vegetated shoreline, and the immediately adjacent cliff faces. A variety of habitat types can be found at the Lake Mead National Recreation Area IBA. The majority of vegetation is Mojave desert scrub, characterized by creosote and bursage. Desert washes support more lush vegetation, including mesquite bosques and acacia thickets. Cliff habitat is present at Lake Mead and in

the Black Canyon below Hoover Dam. Forty springs and over 950 miles of shoreline in the National Recreation Area provide riparian habitat that supports diverse plant and wildlife species. Nearly 370 species of birds have been recorded in the National Recreation Area. This area encompasses migration stopover habitat for waterbirds. The adjacent cliff habitat provides important nesting sites for raptors, particularly peregrine falcons. Other species of note include bald eagle, southwestern willow flycatcher, Lucy's warbler, Bell's vireo, and yellow-breasted chat (National Audubon Society 2011).

USFS Management Indicator Species

The Dixie National Forest would be crossed by the Project in Region III. Management Indicator Species for this forest are presented in **Table 3.7-4**.

Reptiles

The primary habitat type in Region III consists of desert shrubland. Representative reptile species that may be found within the Region III wildlife analysis area include coachwhip, common kingsnake, and glossy snake (UDWR 2005). Desert tortoises also occur in Region III and are addressed in Section 3.8, Special Status Species.

Region IV

Small Mammals

The primary habitat type in Region IV consists of desert shrubland. Representative nongame small mammal species that may be found within the Region IV wildlife analysis area include little brown myotis, desert shrew, white-tailed antelope squirrel, Botta's pocket gopher, brush mouse, and canyon mouse (Hall 1995).

Raptors

The Region IV wildlife analysis area encompasses mostly desert shrubland, which is habitat for breeding and foraging raptor species. Agency raptor nest data is limited within Region IV but suspected nesting raptors that are not classified as special status include red-tailed hawk and great horned owl (**Table 3.7-17**). Special status raptor species that occur in Region IV are addressed in Section 3.8.4.6, Region IV.

Table 3.7-17 Non-Special Status Raptor Species Suspected to Nest in Region IV

Species	Habitat Association[1]
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Great horned Owl	1, 2, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region IV wildlife analysis area falls within USFWS Bird Conservation Region 33 (Sonoran and Mojave Deserts). **Table 3.7-18** presents the two BHCAs that are crossed by the 2-mile transmission line corridor in Region IV and several representative bird species for each (Neel 1999; Nevada Steering Committee IWJV 2005; USFWS 2008). There are two BHCAs located within the Region IV wildlife analysis area comprising a total of 1,036,647 acres.

Table 3.7-18 Birds of Conservation Concern and Partners in Flight Priority Bird Species for Region IV

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
NV	33	5 – Lower Muddy River Complex/Meadow Valley Wash	• Open water • Herbaceous wetland	• Cinnamon teal • Southwestern willow flycatcher[3] • Lucy's warbler[3] • Black-crowned night heron
NV	33	7 – Piute/Eldorado/Fenner DWMA	• Desert shrub	• LeConte's thrasher[3] • Burrowing owl[3] • Ash-throated flycatcher[3] • Phainopepla[3] • Loggerhead shrike[3]

[1] Not an all inclusive list of BCC and PIF species.

[2] Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3] Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

Two Audubon Important Bird Areas are within the Region IV wildlife analysis area.

Lake Mead National Recreation Area IBA – The Lake Mead National Recreation Area IBA is intersected by the 2-mile transmission line corridor in Clark County, Nevada and falls within the Regions III and IV wildlife analysis areas. The 152,860 acre IBA is part of the Lake Mead National Recreation Area. The area of the NRA recognized as an IBA is limited to Lake Mead and Lake Mohave above Davis Dam on the Colorado River, the adjacent vegetated shoreline, and the immediately adjacent cliff faces. A variety of habitat types can be found at the Lake Mead National Recreation Area IBA. The majority of vegetation is Mojave desert scrub, characterized by creosote and bursage. Desert washes support more lush vegetation, including mesquite bosques and acacia thickets. Cliff habitat is present at Lake Mead and in the Black Canyon below Hoover Dam. Forty springs and over 950 miles of shoreline in the National Recreation Area provide riparian habitat that supports diverse plant and wildlife. Nearly 370 species of birds have been recorded in the National Recreation Area. This area encompasses migration stopover habitat for waterbirds. The adjacent cliff habitat provides important nesting sites for raptors, particularly peregrine falcons. Other species of note include bald eagle, southwestern willow flycatcher, Lucy's warbler, Bell's vireo, and yellow-breasted chat (National Audubon Society 2011).

Wee Thump Joshua Tree Forest IBA – The Wee Thump Joshua Tree Forest IBA is located 15 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 30,808 acres containing dense stands of the Joshua Tree forest. Nest cavities are one habitat component that is almost exclusively absent from desert sites, and it is this resource that makes Wee Thump Joshua Tree Forest IBA unique. The ancient Joshua trees, many estimated to be over 250 years old, do contain cavities, which provide important nesting sites and winter refuges for cavity-dependent bird species. These species include gilded flicker, northern flicker, ash-throated flycatcher, and hairy woodpecker (National Audubon Society 2011).

USFS Management Indicator Species

No national forests are crossed by the Project in Region IV; therefore, no MIS are addressed in the impact analysis.

Reptiles

The primary habitat type in Region IV consists of desert shrubland. Representative reptile species that may be found within the Region IV wildlife analysis area include western fence lizard, common side-blotched lizard, and western rattlesnake (SDNHM 2011).

3.7.6 Impacts to Wildlife

Potential direct impacts to wildlife habitats from the transmission line would occur within a 250-foot-wide transmission line right-of-way (ROW) for each alternative. Direct impacts to wildlife habitats from potential access roads would occur within a 2-mile transmission line corridor for each alternative. Although the precise locations for the transmission line and associated access roads are not known, it is known that they will be constructed within the respective 2-mile transmission line corridors.

Several small reroutes and micro-siting adjustments to the proposed alternative routes in Regions I, II, and III have been included in this impact analysis and are described in detail in Section 2.5.1. These adjustments are located along Alternatives I-D, II-A, II-B, II-C, II-E, II-F, III-A, IV-A, and IV-C. Alternatives I-B and I-D have been widened slightly to accommodate possible micro-siting adjustments to avoid greater sage-grouse habitat. The slight changes in impact acreages for micro-siting, widening, reroutes, or merged alternative segments have been analyzed and are reported only if they are expected to cause more than incremental differences. These project adjustments have been incorporated to address concerns regarding USFS IRAs, BLM designated utility corridors, and greater sage-grouse potential habitat.

Impact analyses include wildlife habitat either directly disturbed or indirectly affected by construction within the 2-mile transmission line corridors. This could include direct removal or alteration of habitat within the 2-mile transmission line corridors, or loss of habitat value, both inside or outside of the 2-mile transmission line corridors due to human presence or noise. Wildlife habitats are based on the vegetation communities identified in **Tables 3.7-2** and **3.7-3** that support various species of wildlife seasonally or throughout the year.

Wildlife-related issues addressed by this impact assessment were determined through the public scoping process and in consultation with BLM, BOR, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. Wildlife-related issues ranged from direct loss and fragmentation of big game crucial winter habitat and migratory bird habitat to the direct loss of birds, primarily raptor species, as a result of electrocution, collision with transmission lines and guy wires. The primary impact issues and analysis considerations for wildlife are listed in **Table 3.7-19**.

Table 3.7-19 Relevant Analysis Considerations for Wildlife

Resource Topic	Analysis Considerations and Relevant Assumptions
Habitat loss and fragmentation	• Acres of habitat for wildlife species located within the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for access roads are quantified; • Species-specific avoidance measures are discussed; • The degree to which the loss or fragmentation of habitat would affect individuals and whether these effects could impact populations of affected species are qualitatively discussed; • Changes in vegetation communities that influence wildlife habitat are referenced; • The timeline for vegetation communities to recover to baseline levels is estimated; • Habitat disturbance is related to overall habitat availability in the respective analysis areas; • Impacts resulting from habitat loss and fragmentation are evaluated using the best available literature; and • The lost opportunity for bird conservation represented by fragmentation and other Project impacts in BHCAs is quantified as the acreages of construction, operation, and indirect impacts to BHCAs crossed by the alternative routes and associated facilities.

Table 3.7-19 Relevant Analysis Considerations for Wildlife

Resource Topic	Analysis Considerations and Relevant Assumptions
Loss of or injury to a species, displacement of individuals, and loss of breeding success from exposure to increased noise and human activity	• Impacts of bird and bat collisions from transmission lines on overall populations are evaluated in qualitative terms; • A qualitative discussion of how construction and operation activities may displace or impact breeding activity for wildlife species is included; and • The wildlife/vehicle collision potential is described in both quantitative and qualitative terms.
Potential impacts of increased perches/ predation from Project infrastructure	• Impacts of increased predation by raptors and corvids (e.g., ravens, crows) on wildlife species is evaluated in qualitative terms.

Through the implementation of the following Project design features and BMPs (as outlined in **Appendix C**), the direct impacts to wildlife resources due to construction would be minimized:

- WWEC BMPs – ECO-1/ECO-2/ECO-4/ECO-6/ECO-7/ECO-8 (protection of sensitive wildlife and habitats); FIRE-1/FIRE-2 (fire management and fuels strategies); NOISE-2 (noise reduction strategy); REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours) and REST-2 (restoring vegetation to values commensurate with the ecological setting);
- Agency BMPs – All applicable State and Federal agency No Surface Occupancy restrictions (NSO), Conditional Surface Occupancy (CSO) restrictions, and Timing Limitations (TL) as outlined in **Appendix C**;
- TWE Design Features – TWE-1/TWE-2 (compliance with agency stipulations, laws and regulations); TWE-4 (environmental training); TWE-13/TWE-14/TWE-16 (vegetation management, restoration, and erosion control); TWE-26/TWE-27/TWE-28 (vegetation and noxious weed management); TWE-29/TWE-30/TWE-31/TWE-32/TWE-33/TWE-34 (ecological and special status species protection).

In addition the following mitigation measure for wildlife should be implemented:

WLF-1*: For the protection of breeding migratory birds,* ***WLF-1*** *requires TWE to avoid migratory bird habitat removal on currently undisturbed lands, to the extent possible, between approximately February 1 and July 31 (depends on state) or, alternately, to conduct breeding migratory bird surveys and implement appropriate mitigation in coordination with the BLM, Bureau of Reclamation, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. In addition, in order to avoid impacts to raptors during the breeding season (January 1 to August 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls), TWE would be required to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around active nests, as needed.*

The impact analyses for wildlife assume that the BLM and USFS will continue to manage wildlife habitats in coordination with CPW, NDOW, UDWR, and WGFD. Further assumptions include project design features committed to by TWE and BMPs that would be implemented as applicable under each alternative (**Appendix C**).

3.7.6.1 Impacts to Wildlife from Terminal Construction and Operation

Northern Terminal Habitat Disturbance and Fragmentation

The existing conditions at the proposed Northern Terminal Siting area relative to wildlife habitat can be characterized as highly disturbed and fragmented. Located immediately between the urbanized areas of Sinclair and Rawlins, Wyoming, the siting area exhibits multiple types of anthropogenic disturbance. The

major source of disturbance is the interstate Highway 80 and State Highway 76 corridor located approximately 2.2 miles to the north. This highly active corridor provides constant disturbance from vehicle traffic and fragments the landscape for several miles in both directions. In addition, the Northern Terminal sitting area is fragmented by several existing pipelines, ROWs, County Road 71 to the west, and a Union Pacific Railroad rail line to the north. Other notable sources of disturbance near the Northern Terminal siting area include the Sinclair petroleum refinery located approximately 3 mile to the northeast and the Wyoming State Penitentiary located approximately 3.4 miles to the west.

Potential impacts to wildlife species at the Northern Terminal can be grouped into two main categories: construction and operation. Construction-related impacts are primarily habitat loss, fragmentation, and wildlife mortalities as a result of vehicle collisions and crushing of nests/burrows. Construction impacts account for all disturbance during construction of the Project (e.g., clearing of vegetation for footing construction, upgrading access roads, etc.). Operation impacts are defined as impacts that remain after reclamation is complete and will last at least as long as the Project is in operation and maintenance activities are conducted. Construction-related impacts are typically short-term, whereas operation impacts are typically long-term. Examples of potential operation impacts include habitat disturbance in areas where facilities will be sited, periodic vegetation management activities, wildlife mortalities that occur as a result of collisions with Project facilities, and habitat degradation resulting from increased noise and human activity at the terminal site. During operation of the Project, a portion of habitat disturbed during construction would not be reclaimed until after the end of the Project's design life (decommissioning).

Habitat impacts can be further categorized as direct and indirect. Direct habitat impact results when habitat is destroyed or converted to a form that is unsuitable for the impacted species, typically an operation impact. The primary potential indirect impact is wildlife avoidance (displacement) of otherwise suitable habitat in and around the Northern Terminal site during construction and operation. The primary operation-related impact associated with the terminal is likely to be wildlife mortality as a consequence of electrocution or collision with electrical components. Other potential impacts include habitat avoidance of otherwise suitable habitat due to the presence of the terminal facility and transmission line, avoidance of otherwise suitable habitat due to increased predation from perching raptors, and the increased noise and human presence that are the result of regular maintenance activities.

Construction Impacts

Construction of the Northern Terminal would result in the disturbance of 489 acres of potential wildlife habitat during construction. Approximately 262 acres of temporary use areas would be reclaimed following construction and 227 acres of habitat would remain disturbed during long-term operation of the facility. These areas of impact represent <0.01 percent of shrubland habitat within the Region I wildlife analysis area. The remaining area of disturbance would be reclaimed at the end of the project life (estimated at 50 years).

Impacts to wildlife from surface disturbance would include the loss and fragmentation of wildlife habitat. Habitat loss or alteration would result in direct losses of smaller, less mobile wildlife species, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats.

Big Game Species

Potential direct impacts to big game species (i.e., mule deer and pronghorn) would include the incremental reduction of potential forage and the incremental increase of noxious and invasive weeds and habitat fragmentation from vegetation removal. These impacts would be more pronounced within mule deer and pronghorn crucial winter range. Construction of the Northern Terminal would disturb 376 acres of mule deer crucial/yearlong winter range. This area of impact represents 0.12 percent of the total existing crucial winter range for mule deer within the Region I big game analysis area. These habitats consist primarily of saltbush shrubland and sagebrush shrubland. Impacts to crucial winter range would include the loss of potential cover and forage consisting primarily of woody/shrubby vegetation such as sagebrush, bitterbrush, and winterfat. Loss of available forage (e.g., woody shrubs, such as sagebrush) would result in

a long-term (greater than 25 years) impact to wintering big game species. The application of the BLM Rawlins Field Office RMP's (BLM 2008) seasonal restriction to prevent construction activities on public lands within crucial winter range between November 15 and April 30 would reduce displacement of mule deer during the winter months. However, this protection measure does not limit surface disturbance, and impacts to habitat (i.e., crucial winter range) would still occur. No pronghorn crucial winter range would be disturbed by construction of the Northern Terminal. Impacts to elk and mountain lions at the Northern Terminal are not expected since these species are known to occur at low densities in the vicinity of the Northern Terminal.

Small Game Species

Construction of the Northern Terminal would result in direct impacts to small game species (e.g., greater sage-grouse, mourning dove, desert cottontail, white-tailed jackrabbit, and furbearers) and would include construction- and operation-related disturbance of approximately 489 and 227 acres, respectively. These areas of impact represent <0.01 percent and <0.01 percent of small game habitat, respectively, within the Region I wildlife analysis area. The greater sage-grouse is classified as a federal candidate species, as well as a BLM, USFS, and state sensitive species. Therefore, this species is discussed further in Section 3.8, Special Status Wildlife Species. Impacts from construction of the Northern Terminal also would include animal displacement from disturbed areas and increased habitat fragmentation until reclamation has been completed and vegetation is re-established. In most instances, suitable habitat adjacent to disturbed areas would be available for use by these species. However, displacement would increase competition and could result in local reductions in wildlife populations, if adjacent habitats are at carrying capacity. Potential impacts also could include nest and burrow abandonment or loss of eggs or young. These temporary losses would reduce productivity for that breeding season, given the duration of construction activities in the terminal area. Construction of the Northern Terminal also would result in the indirect disturbance of 36 acres and operation disturbance of 17 acres of waterfowl habitat. These areas represent<0.01 percent and <0.01 percent, respectively of the available waterfowl habitat within the wildlife analysis area.

Several factors would minimize potential impacts to big game and small game species as a result of the construction of the Northern Terminal. The Northern Terminal is located in an area that already has a high level of human presence and noise (e.g., Interstate 80, town of Sinclair). Also, implementation of TWE's design features (TWE-32 and TWE-33) and the Rawlins RMP's crucial winter range timing stipulation would reduce direct impacts to big game and small game species during sensitive periods (e.g., nesting, wintering). Therefore, direct impacts from construction of the proposed project at the Northern Terminal would be limited primarily to habitat loss and fragmentation.

Nongame Species

The types of impacts to nongame species (e.g., small mammals, passerines, raptors, and reptiles) would be similar to those previously discussed for small game species. Construction of the Northern Terminal also would result in the construction disturbance of 489 acres and operation disturbance of 227 acres of potential nongame habitat. These areas of impact represent <0.01 percent and <0.01 percent of potential nongame habitat within the Region I wildlife analysis area.

Raptors and Other Migratory Birds

Raptor Nest Data Assumptions

Raptor species are known to use nests for multiple years. The species using a particular nest may vary annually. For example, owls do not construct their own nests; they use previously constructed nests or burrows. Non-raptor species also use raptor nests and vice versa. Common ravens are not considered raptors, but raptor nest data often include common raven nests for this reason.

When a raptor nest is identified outside of nesting season, or when no birds are present, it is often not possible to determine the species that uses the nest. Such nest occurrence data is still valuable and is included in analyses as unknown. Also, as previously described, the species using a nest can change over time. Nests for which the species is unknown are reported both in Section 3.7, Wildlife and Section 3.8, Special Status Wildlife Species.

Raptor nest data are compiled from seven BLM Field Offices, four National Forest datasets, NDOW, and two private consultants. Every effort was made to compile the most accurate dataset for the project; however, there is potential for duplication. The EIS analysis reports nests within 1 mile of the project reference lines and terminal sites. It is possible for a particular raptor nest to occur within 1 mile of multiple alternative routes, micro-siting options, alternative connectors, alternative variations, electrode sites, and terminal sites. Thus, the nest would be reported as potentially impacted multiple times, once for each of the facilities in its proximity.

Finally, while the most recent raptor nest data has been incorporated into analyses, nests and nest structures (i.e. trees) can be destroyed and new nests are constructed each year. A comprehensive raptor nest survey would be conducted along the agency preferred route prior to construction. This would provide the data needed to inform micro-siting adjustments and timing of construction activities to avoid or minimize impacts to nesting raptors.

Raptor species that are not classified as special status species may either seasonally occupy or remain as yearlong residents in the habitats found at the Northern Terminal. These include northern harrier, Cooper's hawk, red-tailed hawk, American kestrel, great horned owl, and common raven. Common ravens are not considered raptors but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize, historic raven nests. Potential direct impacts to raptors and other migratory birds at the Northern Terminal would include the construction and operation disturbance of approximately 489 acres and 227 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent <0.01 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. Impacts to raptor species can result from the loss or alteration in habitat, reduction in prey base, and increased human disturbance, especially during the breeding season. If construction of the Northern Terminal was to occur during the raptor breeding season in Wyoming (January 1 to July 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls) [BLM 2008]), direct impacts to breeding raptors could include the possible direct loss of nests or indirect effects (e.g., nest abandonment) from increased noise and human presence in proximity to an active nest site.

While no IBAs or BHCAs occur in the vicinity of the Northern Terminal, the habitat types present at this location support migratory bird use for roosting, foraging, and nesting. Direct impacts to migratory birds would include the construction and operation disturbance of 489 acres and 227 acres, respectively, of potentially suitable migratory bird habitat. These areas represent <0.01 percent and <0.01 percent of potentially suitable migratory habitat within the Region I wildlife analysis area. Impacts to migratory bird species would result from loss or alteration of habitat, reduction in forage base, and increased noise and human activity. If construction of the Northern Terminal was to occur during the migratory bird breeding season in Wyoming (January 1 to July 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls [BLM 2008]), direct impacts to breeding birds could include the direct loss of nests or indirect effects (e.g., nest abandonment) from increased noise and human presence in proximity to an active nest site. Design measure ***WLF-1*** addresses impacts to raptors and migratory birds.

WLF-1*: For the protection of breeding migratory birds,* ***WLF-1*** *requires TWE to avoid migratory bird habitat removal on currently undisturbed lands, to the extent possible, between approximately February 1 and July 31 (depends on state) or, alternately, to conduct breeding migratory bird surveys and implement appropriate mitigation in coordination with the BLM, Bureau of Reclamation, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. In addition, in order to avoid impacts to raptors during the breeding season (January 1 to August 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for*

burrowing owls), TWE would be required to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around active nests, as needed.

Effectiveness: In order to minimize impacts to raptors during the breeding season, TWE has committed to implement seasonal timing restrictions in appropriate areas (TWE-32). More specifically, **WLF-1** would require TWE to conduct a preconstruction breeding raptor survey and to implement appropriate mitigation measures, such as buffer zones around active nests, as needed. More specifically, **WLF-1** would require TWE to avoid habitat removal on currently undisturbed lands, to the extent possible, between February 1 to July 31 in Wyoming or, alternatively, to conduct breeding bird surveys and implement appropriate mitigation in coordination with the BLM, USFWS, Western, and WGFD.

Several factors would minimize potential impacts to nongame species, raptors, and other migratory birds as a result of the construction of the Northern Terminal. The Northern Terminal is located in an area that already has a high level of human presence and noise (e.g., I-80, town of Sinclair). Also, implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season. Remaining impacts to nesting raptor and migratory bird species within the Region I wildlife analysis area would be limited primarily to habitat loss and fragmentation.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Southern Terminal and Alternate Southern Terminal

Southern Terminal Habitat Disturbance and Fragmentation

The existing conditions at the proposed Southern Terminal Siting area relative to wildlife habitat can be characterized as moderately disturbed and fragmented. The majority of human disturbance near the siting area results from Interstate Highway 95 located approximately 3.5 miles to the east. This highway is a major source of fragmentation in the local area. The Solar One energy plant located approximately 1.5 miles to the southwest of the siting area contributes to existing disturbance and fragmentation within the siting area. Several existing large transmission lines are located adjacent to the Southern Terminal siting area resulting in further fragmentation of the local landscape.

Construction of the Southern Terminal and the Alternate Southern Terminal would mostly occur in developed/disturbed areas that are not considered to be typical wildlife habitat. Eleven percent of the siting area is desert shrubland. Consequently, species associated with this habitat type in the region (e.g., mourning dove, greater roadrunner, greater short-horned lizard, bushy-tailed woodrat) potentially could be impacted. The Alternate Southern Terminal would potentially impact more desert shrubland habitat than the Southern Terminal, but no substantive impacts resulting from construction of the Southern Terminal or the Alternate Southern Terminal are anticipated.

Southern Terminal located near IPP (Design Option 2)

Construction of the Southern Terminal located near IPP (Design Option 2) would mostly occur in grassland, greasewood flat, and saltbush shrubland vegetation communities. Approximately 77 percent of the siting area is saltbush shrubland. Consequently, species associated with this habitat type in the region (e.g., western meadowlark, badger, white-tailed jackrabbit, gophersnake) potentially could be impacted.

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2). Construction impacts to wildlife species would be anticipated to be similar to those resulting from construction of the preferred alternative.

Operation Impacts

Acres of operation disturbance are presented in the big game species, small game species, and nongame species discussions above. Impacts from operations to these taxa groups are similar to those presented in construction; however, they are less intensive and longer in duration. The additional operation-related impact discussion below describes specific potential for bird mortality during operation of the project.

Northern Terminal

The primary operation-related impact to wildlife, particularly birds, is mortality as a result of electrocution or collision. As described in Section 2.4.3.1, six 500-kV AC line positions, three 500/230-kV transformer banks, eight 230-kV line positions, two 500-kV AC filter line positions, two DC line positions with transformers, converter building(s), and AC and DC filter yards would be constructed at the Northern Terminal. Depending on the design of the facility and the kV capacity, transmission lines and transformers pose an electrocution hazard for bird species, especially raptors, which attempt to perch on the structures. Transmission line configurations greater than 69-kV typically do not present a high risk of avian electrocution, based on conductor placement and orientation (APLIC 2006). The transmission lines also would incrementally increase the collision potential for migrating and foraging bird species. However, collision potential typically is dependent on variables such as the location in relation to high-use habitat areas (e.g., nesting, foraging, and roosting); line orientation to flight patterns and movement corridors; species composition; visibility; and line design (APLIC 2006).

To minimize potential operation-related impacts to raptors and other migratory birds, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Therefore impacts to wildlife species, particularly raptors, from operation of the Northern Terminal would be limited to habitat loss, fragmentation, collision, and disturbance during normal maintenance activities.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Southern Terminal and Alternate Southern Terminal

Operation of the Southern Terminal or the Alternate Southern Terminal would occur in developed/disturbed areas that are not considered to be typical wildlife habitat. Eleven percent of the siting area is desert shrubland. Consequently, species associated with this habitat type in the region (e.g., mourning dove, greater roadrunner, greater short-horned lizard, bushy-tailed woodrat) potentially could be impacted. The Alternate Southern Terminal would potentially impact more desert shrubland habitat than the Southern Terminal, but no substantive impacts resulting from operation of the Southern Terminal or the Alternate Southern Terminal.

Southern Terminal located near IPP (Design Option 2)

Operation of the Southern Terminal located near IPP (Design Option 2) would mostly occur in grassland, greasewood flat, and saltbush shrubland vegetation communities. Approximately 77 percent of the siting

area is saltbush shrubland. Consequently, species associated with this habitat type in the region (e.g., western meadowlark, badger, white-tailed jackrabbit, gophersnake) potentially could be impacted.

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2). Operation impacts to wildlife species would be anticipated to similar to those resulting from construction of the preferred alternative.

Decommissioning Impacts

Impacts to wildlife during decommissioning of the Northern, Southern, Alternate Southern Terminals, Southern Terminal located near IPP (Design Option 2), or the Southern Substation located near IPP (Design Option 3) would be similar to, but substantially less intensive than construction impacts.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Because the implementation of Design Option 2 would utilize the same alternative routes and construction techniques as the proposed Project, impacts to wildlife from construction and operation of Design Option 2 would be similar to those discussed under the alternative routes. Differences between Design Option 2 and the proposed Project include the locations of the Southern Terminal and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The Southern Terminal would be located near IPP in Utah instead of near Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP. Impacts to vegetation from construction and operation of a converter station near IPP, ground electrode system, and series compensation station can be related to wildlife, and are discussed in Section 3.5.6.7.

Table 3.7-20 provides a summary of impacts associated with Design Option 2. Impacts from Design Option 2 facilities would be similar to impacts described in Section 3.7.6.1, Impacts from Terminal Construction and Operation, and Section 3.7.6.2, Impacts Common to all Alternative Routes and Associated Components. The same design features, BMPs, and mitigation measure listed for the Northern Terminal would be implemented to minimize impacts resulting from Design Option 2. Impacts to each wildlife habitat type would be less than 1 percent of the total of each habitat type in the wildlife analysis area.

Table 3.7-20 Summary of Design Option 2 Alternative Ground Electrode Siting Area Impact Parameters for Wildlife

Design Option 2 Converter/Substation
• Approximately 36 acres of construction and 22 acres of operation impacts to pronghorn crucial yearlong range would occur. • Approximately 181 acres of construction and 113 acres of operation impacts to small game and nongame potential habitat would occur. • Approximately 7 acres of construction and 4 acres of operation impacts to waterfowl potential habitat would occur.

[1] Length refers to length of transmission lines and lines serves as a proxy metric for avian collision potential.

Design Option 3 – Phased Build Out

Because the implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed Project, albeit in a phased approach, impacts to wildlife from construction and operation of Design Option 3 would be the same as those discussed under the alternative routes.

Table 3.7-21 provides a summary of impacts associated with Design Option 3.

Table 3.7-21 Summary of Design Option 3 Substation Impact Parameters for Wildlife

Design Option 3 Substation
• Approximately 34 acres of construction and 15 acres of operation impacts to pronghorn crucial yearlong range would occur. • Approximately 170 acres of construction and 75 acres of operation impacts to small game and nongame potential habitat would occur. • Approximately 1 acre of construction and 1 acre of operation impacts to waterfowl potential habitat would occur.

3.7.6.2 Impacts to Wildlife Common to All Alternative Routes and Associated Components

Potential impacts to wildlife species from the alternative routes can be grouped into two main categories, construction and operation. Construction-related impacts are primarily habitat loss, fragmentation, and wildlife mortalities as a result of vehicle collisions and crushing of nests/burrows. Construction impacts account for all disturbance during construction of the Project (e.g., clearing of vegetation for footing construction, upgrading access roads, etc.). Operation impacts are defined as impacts that remain after reclamation is complete and will last at least as long as the Project is in operation and maintenance activities are conducted. Construction-related impacts are typically short-term, whereas operation impacts are typically long-term. Examples of potential operation impacts include habitat disturbance in areas where facilities will be sited, periodic vegetation management activities, wildlife mortalities that occur as a result of maintenance activities, increased predation of local prey populations by perching raptors, and habitat degradation resulting from increased noise and human activity in and along the 2-mile transmission line corridor. During operation of the Project, a portion of habitat disturbed during construction would not be reclaimed until after the end of the Project's design life (decommissioning).

Habitat impacts can be further categorized as direct and indirect. Direct habitat impact results when habitat is destroyed or converted to a form that is unsuitable for the impacted species. The primary potential indirect impact is wildlife avoidance (displacement) of otherwise suitable habitat in and around the Project disturbance areas during construction and operation.

The primary operation-related impact associated with transmission lines and associated facilities are wildlife mortalities as a consequence of electrocution or collision with transmission line components. Other potential impacts include habitat avoidance of otherwise suitable habitat due to the presence of a transmission line, and the increased noise and human presence that are the result of routine maintenance activities.

<u>Construction Impacts</u>

Construction of the proposed Project would result in the alteration, degradation, and loss of wildlife habitat, of which a percentage would be immediately reclaimed following construction of the facilities. The remaining disturbance area would be reclaimed at the end of the life of the project (estimated at 50 years). Recovery times of the various vegetation communities that provide habitat for the species within the wildlife analysis area are discussed in Section 3.5, Vegetation.

Habitat loss or alteration from surface disturbance would result in direct losses of smaller, less mobile species of wildlife, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats. Surface disturbance also would result in an increase in habitat fragmentation along the proposed Project until reclamation has been completed and vegetation is re-established.

The road network, which would be constructed or upgraded to fulfill the construction requirements of the proposed Project, may impact wildlife species to varying degrees depending on the geographical location, type of habitat disturbed, and wildlife species potentially impacted. There are seven general impacts to wildlife habitat associated with roads including: 1) increased mortality from road construction; 2) increased mortality from collisions with vehicles; 3) modification of wildlife behavior; 4) alteration of the physical

environment; 5) alteration of the chemical environment; 6) spread of invasive and exotic species; and 7) increased alteration and use of habitats by humans (Trombulak and Fissell 2000). Not all species and ecosystems are equally impacted by roads, but overall the presence of roads is highly correlated with changes in species composition, population sizes, and hydrologic and geomorphic processes that shape aquatic and riparian habitats (Trombulak and Fissell 2000).

Game Species

Potential direct impacts to big game species (e.g., pronghorn, mule deer, elk, moose, Rocky Mountain bighorn sheep, and desert bighorn sheep) would include the incremental loss of potential forage and the increase of habitat fragmentation from vegetation removal associated with surface disturbance. The primary potential indirect impact would be wildlife avoidance (displacement) of otherwise suitable habitat in the vicinity of Project disturbance areas due to noise and human activity. Impacts due to disturbance may also include both short-term and permanent changes to big game migration corridors during periods of construction and operation activity. Impacts would be more pronounced within big game crucial winter range and desert bighorn sheep occupied habitat. Impacts to crucial winter range would include the loss of potential cover and forage consisting primarily of woody/shrubby vegetation such as sagebrush, bitterbrush, and winterfat. Loss of available forage (e.g., woody shrubs, such as sagebrush) would result in a long-term (greater than 25 years) impact to wintering big game species.

Construction of the proposed Project would result in direct impacts to small game species (i.e., upland game birds, small game mammals, furbearers, and waterfowl) and would include the loss of potentially suitable habitat. Small game species such as the Columbian sharp-tailed grouse, greater sage-grouse, and pygmy rabbit have designated protections (e.g., BLM sensitive, USFS sensitive, state-protected, etc.) and are discussed further in Section 3.8, Special Status Wildlife Species. Impacts from the construction of the alternative routes also would include animal displacement from the disturbance areas and increased habitat fragmentation, until reclamation has been completed and vegetation is re-established. Potential impacts also could include nest and burrow abandonment or loss of eggs or young. These losses could reduce productivity for that breeding season, depending on timing and duration of construction activities in a specific area. Indirect impacts associated with human activity and noise have been shown to negatively impact small game populations, especially upland game birds. These species may experience increased mortality rates due to increased access as a result of new and improved roads (Holbrook and Vaughan 1985). Vehicular traffic may injure or kill individuals, and local populations may experience higher levels of hunting and poaching pressure, due to improved human access (Holbrook and Vaughan 1985). In most instances, suitable habitat adjacent to disturbance areas would be available for use by small game species.

Implementation of TWE-32 and TWE-33 (summarized above and found in **Appendix C**), as well as BLM, USFS, and state wildlife agency restrictions to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would minimize direct impacts to wintering big game species. Similarly, through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts from construction of the proposed Project would be limited primarily to habitat loss and fragmentation.

Nongame Species

The types of impacts to nongame species (e.g., small mammals, reptiles) would be similar to those discussed for small game species. Nongame species such as the Wyoming pocket gopher, midget faded rattlesnake, and desert iguana have designated protections (e.g., BLM sensitive, USFS sensitive, state-protected, etc.) and are discussed further in Section 3.8 Special Status Wildlife Species.

Implementation of TWE's design feature (TWE-32) would limit direct impacts to nongame species during sensitive periods (e.g., nesting and breeding). Therefore, impacts from construction of the proposed Project would be limited primarily to habitat loss and fragmentation.

Raptors and Other Migratory Birds

A number of raptor species that are not classified as special status (e.g., Cooper's hawk, northern harrier, American kestrel, red-tailed hawk, and great-horned owl) may either seasonally occupy or remain as yearlong residents in the habitats found within the wildlife analysis area. Potential direct impacts to raptors would include the loss of potentially suitable breeding, roosting, and foraging habitat. Impacts to raptor species can result from the loss or alteration in habitat, reduction in prey base, and increased human disturbance, particularly during the breeding season. The loss of native habitat to human development has resulted in declines of hawks and eagles throughout the West (Boeker and Ray 1971; Schmutz 1984). In some cases, habitat changes have not reduced numbers of raptors, but have resulted in shifts in species composition (Harlow and Bloom 1987). Impacts to small mammal populations due to habitat loss and fragmentation can result in a reduced prey base for raptors, causing lower raptor densities. Thompson et al. (1982) and Woffinden and Murphy (1989) found that golden eagles and ferruginous hawks had lowered nesting success where native vegetation had been lost and the habitat was unable to support jackrabbit (prey) populations. Furthermore, raptors have a high potential of being disturbed from nests and roosts, which contributes to displacement and reduced nesting success (Holmes et al. 1993; Postovit and Postovit 1987; Stalmaster and Newman 1978).

The availability of raptor nest data, which is typically associated with project surveys, is not an accurate portrayal of the actual distribution and abundance of nesting raptors. The availability of aptor nest data tends to be biased based on whether previous surveys have been conducted in association with other projects. Alternatives that are proposed in areas where other linear projects have not occurred cannot be directly compared to alternatives that may be paralleling exiting linear features where surveys were previously completed. In addition, inactive raptor nests are difficult to attribute to a specific species. Data is often reported as "species unknown". Nonetheless, the number of known raptor nests (active and inactive) along a project alternative is valuable information to be presented in analyses. Prior to construction, a comprehensive raptor nest survey will be conducted for the agency preferred alternative. If construction of the proposed Project was to occur during the raptor breeding season (approximately January 1 to August 15, depending on the species and location), impacts to breeding raptors could include the possible loss of nests or nest abandonment due to increased noise and human activity in proximity to an active nest site. Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species.

As presented above, a total of 21 IBAs and 49 BHCAs occur within the wildlife analysis area. As discussed in Section 3.7.4.3, Wildlife, these areas support a higher diversity of migratory bird species than surrounding areas and encompass critical breeding, foraging, or migration habitat for both common and sensitive migratory bird species. Migratory bird species that may be impacted by construction activities include nesting passerines or songbirds that utilize the various habitats found within the wildlife analysis area. Potential direct impacts to migratory birds would include the construction and operation disturbance of potentially suitable breeding, roosting, and foraging habitat. Impacts to migratory bird species can result from the loss or alteration of habitat, reduction in forage base, and increased human disturbance, especially during the breeding season. If construction of the proposed Project was to occur during the migratory bird breeding season (approximately March 1 to July 31, depending on the state), impacts to breeding birds could include the loss of nests or nest abandonment caused by increased noise and human activity in proximity to an active nest site.

***WLF-1**: For the protection of breeding migratory birds, **WLF-1** requires TWE to avoid migratory bird habitat removal on currently undisturbed lands, to the extent possible, between approximately February 1 and July 31 (depends on state) or, alternately, to conduct breeding migratory bird surveys and implement appropriate mitigation in coordination with the BLM, Bureau of Reclamation, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. In addition, in order to avoid impacts to raptors during the breeding season (January 1 to August 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls), TWE would be required to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around active nests, as needed.*

Effectiveness: In order to minimize impacts to raptors during the breeding season (February 1 to August 15), TWE has committed to implement seasonal timing restrictions in appropriate areas (TWE-32). More specifically, **WLF-1** would require TWE to conduct a preconstruction breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. To minimize impacts to migratory birds during the breeding season, TWE also has committed to implement seasonal timing restrictions in applicable areas (TWE-32). More specifically, **WLF-1** would require TWE to avoid habitat removal on currently undisturbed lands, to the extent possible, between March 1 and July 31 (depending on the state) or, alternately, to conduct breeding bird surveys and implement appropriate mitigation in coordination with the BLM, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season. Remaining impacts to nesting raptor and migratory bird species within the wildlife analysis area would be primarily limited to habitat loss and fragmentation.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Analysis of Wildlife Impacts as a Result of Human Activity and Noise

Indirect impacts from the construction of the proposed Project would result from increased human activity and noise in the vicinity of the terminal locations and the approved 2-mile transmission line corridor. The most common wildlife responses to noise and human activity are avoidance or accommodation. Avoidance would result in displacement of animals from an area larger than the actual disturbance area. Following avoidance of human activity and noise-producing areas during construction, certain wildlife species may acclimate to the activity and begin to return to areas that were formerly avoided. For example, during construction, it is likely that big game species (i.e., pronghorn, mule deer) would be displaced from a larger area than the actual disturbance sites due to the avoidance response. Displacement of big game species as a result of direct habitat loss and indirect reduction in habitat quality has been widely documented (Irwin and Peek 1983; Lyon 1983, 1979; Rost and Bailey 1979). Studies have shown that big game species tend to move away from areas of human activity and roads; thereby reducing habitat utilization near disturbance areas (Cole et al. 1997; Sawyer et al. 2006). However, big game species have demonstrated the ability to acclimate to a variety of activities as long as human harassment levels do not increase substantially (Forman et al. 2003). Therefore, it is possible that the extent of displacement would approximate the actual disturbance area after the first few years of operation (Forman et al. 2003). Mule deer and pronghorn appear to be more tolerant of human activity than desert bighorn sheep. For mule deer, displacement distances from new roads ranged from 330 feet to 0.6 mile, depending on the presence of vegetative cover (Rost and Bailey 1979, as cited in Forman et al. 2003). However, disturbance associated with construction activities would occur over a relatively short period, and it is assumed that big game species would return to the area following completion of Project construction. In addition to an avoidance response, increased human activity intensifies the potential for wildlife/human interactions ranging from harassment of big game species to legal harvest or poaching.

Noise levels associated with construction may impact migratory bird species that occupy habitats in the 2-mile transmission line corridor. Studies also have shown that reductions in bird population densities in both open grasslands and woodlands also may be attributed to a reduction in habitat quality produced by elevated noise levels (Reijnen et al. 1997, 1995). Although visual stimuli in open landscapes may contribute to reduced bird densities at relatively short distances, the impacts of noise appear to be the most critical factor since breeding birds of open grasslands (threshold noise range of 43 to 60 decibels on the A-weighted scale [dBA]) and woodlands (threshold noise range of 36 to 58 dBA) respond very similarly

to disturbance by traffic volume (Reijnen et al. 1997). Reijnen et al. (1996) determined a threshold of effect for bird species to be 47 dBA, while a New Mexico study in a pinyon-juniper community found that impacts of gas well compressor noise on bird populations were strongest in areas where noise levels were greater than 50 dBA. However, moderate noise levels (40 to 50 dBA) also showed some effect on bird densities in this study (LaGory et al. 2001).

For the purposes of this programmatic analysis, the total extent of indirect habitat loss as a result of the wildlife avoidance response is estimated to be the same as the construction noise attenuation distance so that it could be applied across all wildlife species. The analysis conservatively assumes habitat to be flat terrain with no atmospheric conditions or other potential dampening effects, so that construction noise would dissipate to ambient noise levels at a distance of approximately 6,400 feet (1.2 miles). Because many areas along the proposed 2-mile transmission line corridor and its alternatives are characterized by topographic variation and woody vegetation (e.g. shrubland, woodland, forest), this approach likely overestimates potential noise impacts. Using this distance from the 250 foot-wide transmission line ROW and considering the potential for access road development within the 2-mile transmission line corridor, this analysis reports all acreages of habitat within the 2-mile transmission line corridor as being potentially indirectly impacted by noise and human activity. While actual locations of access roads are not yet known and construction would not impact all acres within the 2-mile transmission line corridor, this methodology accounts for areas with more potential for being indirectly impacted by noise and human activity and counterbalances those acreages at the edge of the 2-mile transmission line corridor where the access roads would tie into existing roads. These impacts would occur during Project construction. Subsequent impact summary tables for each of the Project regions present these acreages of indirect impacts.

Several factors would minimize the potential impacts related to human activity and noise during construction of the proposed Project. TWE would implement a mandatory employee biological education program for all personnel working within the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor for potential access roads (TWE-33). This would consist of all contractor and subcontractor personnel and others involved in construction activities being notified of known occurrence of protected species or habitat in the construction area. Sensitive areas will be considered avoidance areas. Prior to any construction activity, avoidance areas will be marked on the ground and maintained through the duration of the contract. TWE's design feature to implement seasonal timing restrictions in certain areas (TWE-32) would help avoid impacts to wildlife during sensitive periods (e.g., nesting and breeding periods). Implementation of **WLF-1** would further define how TWE would avoid impacts to breeding bird species by requiring implementation of seasonal timing restrictions and protection buffers during the raptor and migratory bird breeding seasons. Implementation of the BLM, USFS, and state wildlife agency big game crucial winter timing stipulation would prohibit Project development within big game crucial winter range from approximately November 15 to April 30 (depending on species, state, and management agency), which would reduce impacts to wintering big game species. Remaining noise and human activity impacts to wildlife species within the Region I wildlife analysis area would be limited to habitat avoidance outside of key breeding periods within important habitat types and protection buffers.

<u>Operation Impacts</u>

Game Species

Operation-related impacts to big game and small game species would result primarily from vegetation management and other maintenance activities, including reconnaissance flights for transmission line inspection. Depending on species sensitivity, some species may experience disruption or additional stress due to overhead flights. Vegetation maintenance would have impacts similar to those described above for construction activities. Noise and human activity impacts also are discussed above. Small game species would have potential increased risk of predation by raptor and corvid species, which may perch on transmission lines and towers.

Nongame Species

Potential impacts to nongame species are similar to those discussed above for game species. Additional operation-related impacts to raptors and other migratory birds and bats are discussed below. Operation-related impacts to bat species would be similar to those described below for avian species.

Raptors and Other Migratory Birds

The primary operation-related impacts to birds are mortalities as a result of electrocution and collision with transmission line components. Maintenance activities (vegetation management, ground or air inspections, and repair work) would have indirect impacts, but would be less intense, shorter in duration, and smaller in acreage extent than those described above in the Construction Impacts section and discussed below under indirect construction impacts by region. As described in Section 2.1, the proposed Project would consist of the operation of a 600-kV DC transmission line and two AC/DC converter stations. Transmission lines and transformers pose an electrocution hazard for bird species, especially raptors, which attempt to perch on the structures. However, configurations greater than 69 kV typically do not present a high electrocution potential, based on conductor placement and orientation (APLIC 2006). Avian predators, particularly raptors, are attracted to overhead utility lines because they provide perches for various activities, including hunting (APLIC 2006). Power poles increase a raptor's range of vision, allow for greater speed during attacks on prey, and serve as territorial markers (APLIC 2006; Manville 2002; Steenhof et al. 1993). Transmission line structures can impact small game, nongame, migratory bird, reptile, and amphibian populations by enhancing raptor and corvid populations. Raptors and corvids nest and perch on transmission structures, which create vertical structure in generally treeless shrub-steppe habitats (Knight and Kawashima 1993; Steenhof et al. 1993). Raptors and corvids may then occur at higher densities than normal due to increased nesting locations and perches. For example, within one year of construction of a 372.5-mile transmission line in southern Idaho and Oregon, raptors and common ravens began nesting on the supporting poles. Within ten years of construction, 133 pairs of raptors and ravens were nesting along this stretch (Steenhof et al. 1993). Along a transmission line in Nevada, the mean number of the most common raptor species observed over a six–year period one year prior to and five years after construction of the line remained relatively stable. However, the mean number of common ravens seen per survey point dramatically increased during the first four years after construction before declining drastically the fifth year after construction (Blomberg and Sedinger 2008).

The transmission lines also would incrementally increase the collision potential for migrating and foraging bird species. Collision potential typically is dependent on variables such as the location in relation to high-use habitat areas (e.g., nesting, foraging, and roosting); line orientation to flight patterns and movement corridors; species composition; visibility; and line design (APLIC 2006). However, avian mortality from collisions with power lines is well documented (Brown and Drewien 1995). Although rarely impacting healthy populations with good reproductive potential, collision mortality can be biologically significant to small local populations (Beer and Ogilvie 1972) and endangered species (Faanes 1987; APLIC 1994). Avian loss is often greatest where power lines cross migratory paths, bisect feeding and nesting-roosting sites, or occur adjacent to major avian use areas (Savereno et al. 1996). Higher risk also exists when land topography funnels birds through power-line corridors (Bevanger 1990; Faanes 1987). While some species of birds (e.g., upland game birds and certain grassland migratory birds) are predominantly ground dwelling species, the risk for collision during flight is heavily dependent upon transmission line locations, such as locations between loafing and feeding areas or migration routes. Highest collision probabilities appear to occur where birds typically fly between foraging and loafing habitats bisected with overhead lines (Science Applications International Corporation [SAIC] 2001).

Factors that influence the risk of collision to individual birds as they encounter power lines are varied and include flight characteristics, previous experience with power lines (typically a function of age), weather, and power line structural characteristics (APLIC 2006, 1994; Thompson 1978). The static wire, also referred to as the shield or groundwire, has posed the greatest collision danger to birds (APLIC 1994; Faanes 1987). Research has indicated that most collisions occur with static wires when birds increased

their altitude in apparent attempts to avoid conductor wires. Birds maneuvering to avoid the conductor wires actually increased collision risk, and in the absence of static wires most collisions could have been avoided. If power lines must be placed above ground, the risk of colliding would probably be reduced if all wires were in a single horizontal plane (Bevanger 1994).

Research on communication and meteorological towers suggests that the use of guy wires increases avian collision risk and mortality (Gehring et al. 2009; Manville 2009, 2005; Erickson et al. 2005). Although these types of towers tend to be considerably taller and have more complex guy wire configurations than the transmission line tower designs being considered for this project, the use of guyed transmission towers would be likely to increase avian collision risk relative to unguyed towers. This risk can be expected to be higher for species with high wing loading and rapid flight such as wild turkeys, grouse, and waterfowl. Where guy wires must be used, they should be adequately marked with bird diverters to reduce avian collision risk (Manville 2005; APLIC 1994).

Research conducted by Savereno et al. (1996) indicates that the height of the transmission lines relative to a bird's flight heights could be a potential risk factor. Empirical data and theoretical considerations indicate that species with high wing loading and low aspect run a high risk of colliding with power lines. These birds are characterized by rapid flight, and the combination of heavy body and small wings restricts swift reactions to unexpected obstacles (Bevanger 1998). Raptors have a much greater wing to body ratio, and are more likely to fly at levels well above the transmission line heights, and maintain flight levels for an extended period of time. Other bird species, such as upland game birds, may have a greater potential for collision risk because of the smaller wing to body ratio, resulting in lower flight heights and a greater occurrence of takeoffs and landings crossing the transmission line levels.

Operation-related impacts to raptors and other migratory birds may be more pronounced in areas near Audubon IBAs. As discussed in Section 3.7.4.3, Nongame Species, these areas have unique habitat (e.g., wetlands, playas) or geographical features (e.g., canyons, gorges) that provide important habitat for raptors and other migratory birds throughout the year or during migration.

To minimize potential operation-related impacts to wildlife as a result of the proposed Project, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Even with implementation of the proposed design features, there would be some remaining potential for avian collisions with the transmission line and towers. However, the potential for electrocution impacts to bird species within the wildlife analysis area would be negligible. Wildlife prey species also would be impacted due to the potential for increased avian predator populations nesting on power line structures. **SSWS-5** (anti-perching within key greater sage-grouse habitat) presented in Section 3.8 also would benefit other wildlife prey species.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Decommissioning Impacts

The types of impacts to wildlife during decommissioning of the Project would be similar to, but substantially less intensive than construction impacts.

3.7.6.3 Region I

Alternative I-A (Applicant Proposed)

Alternative I-A Habitat Disturbance and Fragmentation

Alternative I-A would cross approximately 155 miles of wildlife habitat in Wyoming and Colorado. Approximately 62 miles (40 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-A 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-A follows the I-80 corridor for approximately 40 miles from Rawlins, Wyoming, to just south of Wamsutter, Wyoming, at which point it turns south towards the Wyoming-Colorado border. This section of Alternative I-A is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-A are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 458 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the lowest existing road density within the 2-mile corridor amongst Region I alternatives.

Table 3.7-22 Summary of Existing Conditions by Alternative within Region I

Alternative	Total Length (miles)	Length of Greenfield Construction	Length of Co-Located Construction	Miles of Existing Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
I-A	155	93	62	458	2.95
I-B	159	91	68	461	2.89
I-C	186	88	98	662	3.56
I-D (Agency Preferred)	171	109	63	550	3.20

Table 3.7-23 provides a tabulation of impacts associated with the alternative routes in Region I. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Key Parameters Summary

Game Species

Alternative I-A would result in the direct disturbance to pronghorn, mule deer, and elk crucial winter ranges (**Table 3.7-23**). Implementation of the BLM, CPW, and WGFD restriction to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would prevent direct impacts to wintering big game species. Alternative I-A would result in the construction and operation disturbance of 5,159 acres and 512 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.10 and <0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-A also would result in the construction disturbance of 110 acres and operation disturbance of 9 acres of waterfowl habitat. These areas represent 0.13 percent and 0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-23 Summary of Region I Alternative Route Impact Parameters for Wildlife

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species												
Colorado pronghorn severe winter range (acres)	157	43	12,299	163	38	18,366	248	62	20,068	163	38	18,366
Percentage of existing habitat within the Region I big game analysis area	0.08	0.02	6.19	0.08	0.02	9.25	0.12	0.03	10.11	0.08	0.02	9.25
Wyoming pronghorn crucial winter/yearlong range (acres)	135	37	13,007	125	34	12,175	519	110	45,484	277	64	22,636
Percentage of existing habitat within the Region I big game analysis area	0.03	<0.01	2.68	0.03	<0.01	2.51	0.11	0.02	9.36	0.06	0.01	4.66
Colorado mule deer severe winter range (acres)	207	57	18,366	167	40	22,550	725	187	69,373	167	40	22,550
Percentage of existing habitat within the Region I big game analysis area	0.03	<0.01	2.71	0.02	<0.01	3.33	0.11	0.03	10.24	0.02	<0.01	3.33
Wyoming mule deer crucial winter range (acres)	0	0	0	0	0	0	10	2	4,209	0	0	0
Percentage of existing habitat within the Region I big game analysis area	0	0	0	0	0	0	0.02	<0.01	7.43	0	0	0
Wyoming mule deer crucial winter/yearlong range (acres)	112	29	9,880	113	29	9,999	427	91	34,221	283	59	20,727
Percentage of existing habitat within the Region I big game analysis area	0.04	<0.01	3.23	0.04	<0.01	3.27	0.14	0.03	11.18	0.09	0.02	6.77
Colorado elk severe winter range (acres)	285	77	23,281	377	95	41,047	1,335	345	122,036	377	95	41,047
Percentage of existing habitat within the Region I big game analysis area	0.03	<0.01	2.29	0.04	<0.01	4.04	0.13	0.03	12.00	0.04	<0.01	4.04
Colorado elk parturition range	218	61	20,766	82	23	21,302	<1	<1	32	82	23	21,302
Percentage of existing habitat within Region I big game analysis area	<1	<1	5.61	<1	<1	5.76	<1	<1	<1	<1	<1	5.76

Table 3.7-23 Summary of Region I Alternative Route Impact Parameters for Wildlife

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Wyoming elk crucial winter/yearlong range (acres)	24	6	1,782	24	6	1,782	7	2	898	24	6	1,779
Percentage of existing habitat within the Region I big game analysis area	0.01	<0.01	0.86	0.01	<0.01	0.86	<0.01	<0.01	0.44	0.01	<0.01	0.86
Small Game and Nongame Species												
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile habitat (acres)[1]	5,159	512	207,395	5,252	482	229,262	6,188	599	236,625	5,644	516	247,824
Percentage of existing habitat within the Region I wildlife analysis area	0.10	<0.01	3.96	0.10	<0.01	4.38	0.12	0.01	4.52	0.11	<0.01	4.74
Waterfowl habitat (acres)[2]	110	9	3,427	90	8	3,365	59	7	4,601	120	10	4,343
Percentage of existing habitat within the Region I wildlife analysis area	0.13	0.01	4.03	0.11	<0.01	3.96	0.07	<0.01	5.41	0.14	0.01	5.11
Relative Collision Potential for Migratory Birds												
Length of transmission line (miles)[4]	155			159			186			171		
Raptor Nests (Non-special Status)												
Number within 1 mile of the reference line[3]	60			96			149			202		
Bird Habitat Conservation Areas												
BHCAs crossed by 250 foot-wide transmission line ROW (acres)	1,356			1,304			2,231			1,322		
Percentage of existing BHCA habitat within the Region I wildlife analysis area	0.06			0.06			0.11			0.06		

Table 3.7-23 Summary of Region I Alternative Route Impact Parameters for Wildlife

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Audubon Important Bird Areas												
Powder Rim IBA crossed by the 2-mile transmission line corridor (acres)	9,708			9,456			2,023			11,988		
Muddy Creek Wetlands IBA crossed by the 2-mile transmission line corridor (acres)	0			0			2,023			3,131		
Percentage of IBA within the Region I wildlife analysis area	5.84			5.69			1.22			7.21		

[1] Vegetation communities used to calculate acreages of habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland other coniferous forest, other deciduous forest, open water, pinyon-juniper, sagebrush shrubland, saltbush shrubland, tundra, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities used to calculate acreages of waterfowl habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of 175 raptor nests of unknown species are documented in Region I. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8.5.3, Region I.

[4] Length refers to length of 600-kV transmission lines, and serves as a proxy metric for avian collision potential.

Nongame Species

Impacts under Alternative I-A would occur as the result of the construction disturbance of 5,159 acres and operation disturbance of 512 acres of small mammal and reptile habitat. These areas represent 0.10 percent and <0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Implementation of TWE's design feature (TWE-32) would limit direct impacts to nongame species during sensitive periods (e.g., nesting and breeding). Therefore, impacts would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

Potential direct impacts to raptors and other migratory birds under Alternative I-A would include the construction and operation loss of approximately 5,159 acres and 512 acres, respectively, of potentially suitable breeding, roosting, and foraging habitat. These areas represent 0.10 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-A is found in **Tables 3.7-22** and **3.7-23**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 60 raptor nests that are not classified as special status occur within 1 mile of the reference line under Alternative I-A (**Tables 3.7-23** and **3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-A. **Table 3.7-24** presents known raptor nests within 1 mile of the reference line corridor in Region I.

Table 3.7-24 Non-special Status Raptor Nests Documented Within 1 Mile of the Reference Line in Region I

Species	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D	Tuttle Easement Micro-siting Option 1	Tuttle Easement Micro-siting Option 2	Tuttle Easement Micro-siting Option 3	Tuttle Easement Micro-siting Comparable Portion of Alternative I-D	Mexican Flats alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Northern harrier	2	2	3	2	0	0	0	0	0	0	1	0
Cooper's hawk	1	1	3	2	0	0	0	0	0	1	1	0
Red-tailed hawk	5	20	25	14	0	0	0	0	0	6	6	0
American kestrel	3	8	9	3	0	0	0	0	0	1	1	0
Great horned owl	1	4	5	3	0	0	0	0	0	1	4	0

Table 3.7-24 Non-special Status Raptor Nests Documented Within 1 Mile of the Reference Line in Region I

Species	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D	Tuttle Easement Micro-siting Option 1	Tuttle Easement Micro-siting Option 2	Tuttle Easement Micro-siting Option 3	Tuttle Easement Micro-siting Comparable Portion of Alternative I-D	Mexican Flats alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Common raven	1	1	1	1	0	0	0	0	0	0	0	0
Unknown raptor species	47	60	103	177	24	24	24	24	3	31	6	1
Totals	60	96	149	202	24	24	24	24	3	40	19	1

[1] Special status raptor species are presented in Section 3.8, Special Status Wildlife.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010, 2012; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-LaSal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012, AECOM 2012..

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative I-B

Alternative I-B Habitat Disturbance and Fragmentation

Alternative I-B would cross approximately 159 miles of wildlife habitat in Wyoming and Colorado. Approximately 68 miles (43 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-B 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-B follows the I-80 corridor for approximately 40 miles from Rawlins, Wyoming, to just south of Wamsutter, Wyoming, at which point it turns south towards the Wyoming-Colorado border. This section of Alternative I-B is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-B are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 461 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the third highest existing road density within the 2-mile corridor amongst Region I alternatives.

Game Species

The types of impacts to big game species under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-B would result in the construction and operation disturbance to 5,252 acres and 482 acres, respectively, of potentially suitable upland game bird, small game mammal,

and furbearer habitat. These areas represent 0.10 percent and <0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-B also would result in the construction disturbance of 90 acres and operation disturbance of 8 acres of waterfowl habitat. These areas represent 0.11 percent and <0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative I-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-B would result in the construction and operation disturbance of 5,252 acres and 482 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.10 percent and <0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative I-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-B would result in the construction and operation disturbance of 5,252 acres and 482 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.10 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-B is found in **Tables 3.7-22** and **3.7-23**. Potential impacts to raptors and migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 96 raptor nests that are not classified as special status occur within 1 mile of the reference line under Alternative I-B (**Table 3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative I-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-B.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative I-C

Alternative I-C Habitat Disturbance and Fragmentation

Alternative I-C would cross approximately 186 miles of wildlife habitat in Wyoming and Colorado. Approximately 98 miles (53 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-C 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-C follows the I-80 corridor for approximately 32 miles from Rawlins, Wyoming, to just south of Creston junction, Wyoming, at which point it turns south following the State Highway 798 corridor towards the Wyoming-Colorado border. This section of Alternative I-C is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-C are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 662 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the highest existing road density within the 2-mile corridor amongst Region I alternatives.

Game Species

The types of impacts to big game species under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-C would result in the construction and operation disturbance of 6,188 acres and 599 acres, respectively, of potentially suitable upland game bird, small game mammal, and furbearer habitat. These areas represent 0.12 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-C also would result in the construction disturbance of 59 acres and operation disturbance of 7 acres of waterfowl habitat. These areas represent 0.07 percent and <0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative I-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-C would result in the construction and operation disturbance of 6,188 acres and 599 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.12 percent and 0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative I-C would generally be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative I-C would result in the construction and operation disturbance of 6,188 acres and 599 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.12 percent and 0.01 percent of potentially suitable raptor and migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-C is found in **Table 3.7-23**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or

exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 149 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative I-C (**Table 3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative I-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative I-D (Agency Preferred)

Alternative I-D Habitat Disturbance and Fragmentation

Alternative I-D would cross approximately 171 miles of wildlife habitat in Wyoming and Colorado. Approximately 63 miles (36 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-D 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-D follows the I-80 corridor for approximately 40 miles from Rawlins, Wyoming, to just south of Wamsutter, Wyoming, at which point it turns south towards the Wyoming-Colorado border. This section of Alternative I-D is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-D are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 550 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the second highest existing road density within the 2-mile corridor amongst Region I alternatives.

Game Species

The types of impacts to big game species under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-D would result in the construction and operation disturbance of 5,644 acres and 516 acres, respectively, of potentially suitable upland game bird, small game mammal, and furbearer habitat. These areas represent 0.11 percent and <0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-D also would result in the construction disturbance of 120 acres and operation disturbance of 10 acres of waterfowl habitat. These areas represent 0.14 percent and 0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative I-D generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-D would result in the construction and operation disturbance of 5,644 acres and 516 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.11 percent and <0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative I-D would result in the construction and operation disturbance of 5,644 acres and 516 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-D is found in **Table 3.7-23**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 202 raptor nests that are not classified as special status occur within 1 mile of the reference line under Alternative I-D (**Table 3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-D.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Tuttle Easement Micro-siting Options

TWE has developed three potential options to avoid or minimize the crossing of the Tuttle Easement and the NPS Deerlodge Road along Alternative I-D. These are referred to as Tuttle Easement micro-siting options 1, 2, and 3. CPW holds a conservation easement over portions of the Tuttle Ranch, located east of the town of Elk Springs in Moffat County, Colorado. The Tuttle Ranch supports an important white-tailed prairie dog colony, which is suitable habitat for the black-footed ferret. It is intended that future black-footed ferret reintroductions will occur within this conservation easement.

The differences in the potential impacts to local wildlife populations resulting from these micro-siting options when compared to Alternative I-D are anticipated to be minor in terms of the number of acres of habitat directly impacted. The substantive difference between the micro-siting options and Alternative I-D involves the level of habitat fragmentation resulting from construction. Although micro-siting option 1 would cross the conservation easement and areas of active white-tailed prairie dog colonies similar to Alternative I-D, Option 1 would be located immediately adjacent to an existing 345-kV transmission line therefore reducing the amount of habitat fragmentation resulting from construction in comparison to Alternative I-D. Micro-siting options 2 and 3 would differ from Alternative I-D by not crossing the conservation easement and active white-tailed prairie dog colonies but would result in increased habitat fragmentation as construction would be located in an area with no existing overhead transmission lines.

Region I Conclusion

Based on a comparison of impact parameters for Region I alternatives, potential construction and operation impacts to wildlife would be greatest for Alternative I-C as shown in **Table 3.7-23**. Potential effects for Alternatives I-A, I-B, and I-D would be relatively low compared to those of Alternative I-C. Alternative I-C would result in the greatest direct and indirect impacts to big game habitat, small game habitat, and migratory bird habitat in comparison to the other Region I alternatives. Alternative I-C also would result in the greatest impacts to existing raptor nests and BHCAs in comparison to the other Region I alternatives (**Table 3.7-23**). Alternative I-C also could result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-8**. Even though the greatest level of impacts are associated with Alternative I-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.3 and **Appendix C**).

Alternative Connectors in Region I

Both the Mexican Flats Alternative Connector and the Baggs Alternative Connector would include minimal increases of total habitat disturbance relative to the total impacts associated with Region I alternatives if they were to be utilized. Both Alternative Connectors would cross pronghorn and mule deer crucial winter range. **Table 3.7-25** summarizes impacts associated with the alternative connectors in Region I.

Table 3.7-25 Summary of Region I Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Impact Parameters
Mexican Flats Alternative Connector	Big Game Species • Approximately 48 acres of construction, 9 acres of operation, and 3,123 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 4 acres of construction, 1 acre of operation, and 82 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 10 acres of construction, 2 acres of operation, and 617 acres of indirect impacts to mule deer crucial winter range would occur. Small Game and Nongame Species • Approximately 10 miles in length.[1] • An additional 322 acres of construction, 25 acres of operation and 9,018 acres of indirect impacts to small game and nongame potential habitat would occur. Approximately 4 acres of construction, 0 acres of operation, and 302 acres of indirect impacts to waterfowl potential habitat would occur. • Three non-special status raptor nests are within 1 mile of the reference line. These nests, for which the species is not known, potentially could be utilized by special status raptor species.

Table 3.7-25 Summary of Region I Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Impact Parameters
	• Muddy Creek Wetlands IBA is crossed by the 2-mile transmission line corridor for a total of 1,513 acres.
Baggs Alternative Connector	Big Game Species • Approximately 225 acres of construction, 52 acres of operation, and 18,595 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 290 acres of construction, 69 acres of operation, and 24,457 acres of indirect impacts to mule deer crucial winter/yearlong range would occur.
	Small Game and Nongame Species • Approximately 22 miles in length.[1] • Approximately 737 acres of construction, 68 acres of operation, and 24,777 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 7 acres of construction and 1 acre of operation and 505 acres of indirect impacts to waterfowl potential habitat would occur. • Forty non-special status raptor nests are within 1 mile of the reference line. Thirty-one of these nests, for which the species is not known, potentially could be utilized by special status raptor species. IBAs • Powder Rim IBA is crossed by the 2-mile transmission line corridor for a total of 4,950 acres. BHCAs • Powder Rim BHCA is crossed by the 2-mile transmission line corridor for a total of 169 acres.
Fivemile Point North Alternative Connector	Big Game Species • Approximately 9 acres of construction, 1 acre of operation, and 121 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 82 acres of construction, 8 acres of operation, and 2,637 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. Small Game and Nongame Species • Approximately 3 miles in length.[1] • Approximately 85 acres of construction, 7 acres of operation, and 2,546 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 1 acre of construction, 0.1 acres of operation, and 20 acres of indirect impacts to waterfowl potential habitat would occur. • Nineteen non-special status raptor nests are within 1 mile of the reference line. Six of these nests for which the species is not known potentially could be utilized by special status raptor species.
Fivemile Point South Alternative Connector	Big Game Species • Approximately 31 acres of construction, 6 acres of operation, and 1,497 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. Small Game and Nongame Species • Approximately 2 miles in length.[1] • Approximately 73 acres of construction, 6 acres of operation, and 1,485 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 23 acres of indirect impacts to waterfowl potential habitat would occur. • One non-special status raptor nest is within 1 mile of the reference line. This nest, for which the species is not known, potentially could be utilized by special status raptor species.

[1] Note: Length refers to length of 600 kV transmission lines, and serves as a proxy metric for avian collision potential.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the Northern Terminal, as discussed in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The types of impacts associated with constructing and operating this system will be similar to those discussed under Alternative I-A but will be significantly reduced in scope and intensity. The ground electrode systems are detailed in Section 2.4.3, Facilities Common to All Action Alternatives. Direct impacts to wildlife habitat will include those resulting from construction of the ground electrode site and access roads. Indirect impacts to wildlife will include disturbance from operation activities and habitat fragmentation resulting from access road construction and the operation of the low voltage overhead line. The ground electrode overhead line will be similar to a modified 345-kV/69-kV distribution transmission line as discussed in Section 2.4.3, and will meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines : The State of the Art in 2006* (APLIC 2006). **Table 3.7-26** summarizes impacts associated with the seven combinations of alternative route and location possibilities for the northern ground electrode system. **Table 3.7-27** presents known raptor nests within 1 mile of the ground electrode system locations.

Table 3.7-26 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Separation Flat – All Alternative Routes	• Approximately 13 miles in length.[2] • Approximately 351 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 63 acres of construction, 19 acres of operation, and 13,232 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 4 acres of construction, 1 acre of operation, and 579 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 1,307 acres of indirect impacts to the Shamrock Hills Raptor Area BHCA would occur. • Approximately 1,308 acres of indirect impacts to the Shamrock Hills Raptor Concentration Area IBA would occur.
Shell Creek (Alternatives I-A and I-D)	• Approximately 33 miles in length.[2] • Approximately 12 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 220 acres of construction, 88 acres of operation, and 13,294 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 6 acres of construction, 2 acres of operation, and 290 acres of indirect impacts to waterfowl potential habitat would occur.
Little Snake East (Alternatives I-A, I-B, and I-D)	• Approximately 9 miles in length.[2] • Approximately 19 acres of construction, 5 acres of operation, and 2,942 acres of indirect impacts to pronghorn severe winter range would occur. • Approximately16 acres of construction, 4 acres of operation, and 1,079 acres of indirect impacts to mule deer severe winter range would occur. • Approximately 2 acres of construction, 1 acre of operation, and 1,529 acres of indirect impacts to elk severe winter range would occur. • Approximately 107 acres of construction, 29 acres of operation, and 13,327 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 156 acres of indirect impacts to waterfowl potential habitat would occur. • The Routt and Moffat County Uplands BHCA is crossed by this ground electrode and associated facilities for a total of 9,102 acres. • Approximately 13,597 acres of indirect impacts to the Routt and Moffat County Uplands BHCA would occur.

Table 3.7-26 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Little Snake West (Alternative I-A)	• Approximately 10 miles in length.[2] • Approximately 7 acres of construction, 2 acres of operation, and 2,105 acres of indirect impacts to elk severe winter range would occur. • Approximately 79 acres of construction, 24 acres of operation, and 5,626 acres of indirect impacts to pronghorn severe winter range would occur. • Approximately 1,455 acres of indirect impacts to mule deer severe winter range would occur. • Approximately 121 acres of construction, 37 acres of operation, and 13,202 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 308 acres of indirect impacts to waterfowl potential habitat would occur. • The Routt and Moffat County Uplands BHCA is crossed by this ground electrode and associated facilities for a total of 4,797 acres. • Approximately 13,599 acres of indirect impacts to the Routt and Moffat County Uplands BHCA would occur.
Shell Creek (Alternative I-B)	• Approximately 26 miles in length.[2] • Approximately 12 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 213 acres of construction, 76 acres of operation, and 13,294 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 6 acres of construction, 2 acres of operation, and 290 acres of indirect impacts to waterfowl habitat would occur.
Little Snake West (Alternative I-B and I-D)	• Approximately 5 miles in length.[2] • Approximately 6 acres of construction, 1 acre of operation, and 2,105 acres of indirect impacts to elk severe winter range would occur. • Approximately 60 acres of construction, 13 acres of operation, and 5,626 acres of indirect impacts to pronghorn severe winter range would occur. • Approximately 1,455 acres of indirect impacts to mule deer severe winter range would occur. • Approximately 92 acres of construction, 21 acres of operation, and 13,202 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 308 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 13,599 acres of indirect impacts to the Routt and Moffat County Uplands BHCA would occur.
Eight Mile Basin	• Approximately 4 miles in length.[2] • Approximately 66 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 12,538 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 170 acres of indirect impacts to waterfowl potential habitat would occur.
Separation Creek	• Approximately 14 miles in length.[2] • Approximately 102 acres of construction, 36 acres of operation, and 4,343 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 34 acres of construction, 12 acres of operation, and 1,880 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 13,290 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 154 acres of indirect impacts to waterfowl potential habitat would occur.

[1] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[2] Length refers to length of 34.5 kV transmission lines, and serves as a proxy metric for avian collision potential.

Table 3.7-27 Non-special Status Raptor Nests Within 1 Mile of the Ground Electrode System Locations[1]

Alternative Ground Electrode System Locations	Raptor Nests[2,3,4]
Separation Flat (All Alternatives)	2 American kestrel, 1 red-tailed hawk, 3 unknown raptor species nests
Shell Creek (Alternatives I-A, I-B, I-D)	1 American kestrel, 1 unknown raptor species nest
Little Snake East (Alternatives I-A, I-B, I-D)	1 red-tailed hawk, 5 unknown raptor species nests
Little Snake West (Alternatives I-A, I-B, I-D)	27 unknown raptor species nests
Eight Mile Basin (All Alternatives)	2 red-tailed hawk nests
Separation Creek (All Alternatives)	7 American kestrel, 1 great-horned owl, 3 northern harrier, 9 red-tailed hawk, 3 unknown raptor species nests

[1] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[2] Special status raptor species are presented in Section 3.8, Special Status Wildlife.

[3] Raptor nests are a total of those within 1 mile of the reference line, site, and siting area. Some duplication exists due to the unknown exact locations of electrode sites and associated features.

[4] Nests of raptor species, which are classified as special status, are tabulated in Section 3.8, Special Status Wildlife Species. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

3.7.6.4 Region II

As presented in **Table 3.7-28**, the Project alternatives cross five national forests. This table presents miles of NFS land crossed by alternative and associated Project components in order to provide a general understanding of potential for impacts. Additional information on potential impacts to wildlife in the national forests is provided in the Region II and Region III discussions.

Table 3.7-28 Miles of National Forest Crossed by Region, Alternative, Alternative Connector, or Alternative Variation

	Region II									Region III				
												Alternative Variation		
National Forest	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F	Emma Park Alternative Variation	Comparable Portion of Emma Park Alternative	Highway 191 Alternative Connector	Lynndyl Alternative Connector	Alternative III-A	Ox Valley East	Ox Valley West	Pinto
Uintah-Wasatch-Cache	18	0	0	0	8	10	0	2	0	0	0	0	0	0
Manti-La Sal	3	19	0	9	0	3	0	0	0	0	0	0	0	0
Ashley	0	0	0	0*	10	<1	0	<1	0	0	0	0	0	0
Fishlake	0	4	29	0	0	4	0	0	0	<1	0	0	0	0
Dixie	0	0	0	0	0	0	0	0	0	0	16	27	20	34
Total miles of forest crossed by route in region	21	23	29	9	18	17	0	2	0	<1	16	27	20	34

* While Alternative II-D alignment does not cross the Ashley National Forest, because the route so closely follows the boundary, there are potential associated impacts that are discussed in the Region II section.

Table 3.7-29 provides a tabulation of impacts to wildlife associated with the alternative routes in Region II. **Table 3.7-30** provides a tabulation of impacts to USFS MIS, which are not classified as special status, associated with the alternative routes in Region II. MIS that are classified as special status species are discussed in Section 3.8, Special Status Wildlife Species. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Alternative II-A (Applicant Proposed)

Alternative II-A Habitat Disturbance and Fragmentation

Alternative II-A would cross approximately 257 miles of wildlife habitat in Colorado and Utah. Approximately 225 miles (86 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-A 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-A in western Colorado and eastern Utah include several livestock operation roads, a major surface coal mining operation located within the 2-mile corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-A in Moffat County, Colorado, also is fragmented by the existence of U.S highway 40 which parallels the 2-mile corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include oil and gas operations, livestock operations, and center pivot agriculture operations near the communities of Roosevelt and Duchesne. In Duchesne County, Utah, sources of disturbance include oil and gas operations, livestock operations, and center pivot agriculture operations, and the communities of Fort Duchesne, Roosevelt, and Fruitland. Wildlife habitat in Wasatch County, Utah, becomes less fragmented as the landscape become more forested and mountainous. In Utah County, Utah, the major source of fragmentation within the 2-mile corridor is State Highway 89 and State Highway 6 which parallel Alternative II-A for approximately 17 miles. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, Utah, and the Intermountain Power Plant located north of Delta, Utah. A total of 1,256 miles of existing roads are located within the Alternative II-A 2-mile corridor as shown **Table 3.7-30**. This represents the highest existing road density within the 2-mile corridor amongst Region II alternatives.

Key Parameters Summary

Game Species

Alternative II-A would result in the direct disturbance to pronghorn, mule deer, elk, moose, and Rocky Mountain bighorn sheep crucial winter habitat (**Table 3.7-29**). Implementation of the BLM, CPW, UDWR, and USFS restriction to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would prevent direct impacts to wintering big game species. Alternative II-A would result in the construction and operation disturbance of 8,613 acres and 1,110 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.08 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-A also would result in the construction disturbance of 131 acres and operation disturbance of 17 acres of waterfowl habitat. These areas represent 0.05 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-29 Summary of Region II Alternative Route Impact Parameters for Wildlife

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species																		
Colorado pronghorn severe winter range (acres)	0	0	0	57	15	4,836	57	15	4,836	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II big game analysis area	0	0	0	0.37	0.09	31.21	0.37	0.09	31.21	0	0	0	0	0	0	0	0	0
Utah pronghorn crucial yearlong range (acres)	731	219	67,961	1,217	288	102,765	1,029	249	84,160	1,275	354	111,220	768	192	73,610	1,047	284	83,693
Percentage of existing habitat within the Region II big game analysis area	0.01	<0.01	1.32	0.02	<0.01	2.00	0.02	<0.01	1.64	0.02	<0.01	2.13	0.01	<0.01	1.43	0.02	<0.01	1.62
Utah pronghorn substantial yearlong range (acres)	80	18	9,739	406	97	39,549	491	114	43,163	19	8	2,566	226	60	20,802	18	7	2,566
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	1.04	0.04	0.01	4.23	0.05	0.01	4.62	<0.01	<0.01	0.27	0.02	<0.01	2.22	<0.01	<0.01	0.27
Colorado mule deer severe winter range (acres)	248	63	25,313	188	48	16,000	188	48	16,000	248	63	25,390	248	63	25,390	248	63	25,390
Percentage of existing habitat within the Region II big game analysis area	0.14	0.03	14.10	0.10	0.03	8.91	0.10	0.03	8.91	0.14	0.03	14.14	0.14	0.03	14.14	0.14	0.03	14.14
Utah mule deer crucial winter range (acres)	793	299	78,508	648	227	47,244	755	206	64,596	575	202	38,237	824	318	47,908	555	219	37,270
Percentage of existing habitat within the Region II big game analysis area	0.02	<0.01	2.25	0.02	<0.01	1.35	0.02	<0.01	1.85	0.02	<0.01	1.10	0.02	<0.01	1.37	0.02	<0.01	1.07
Colorado elk severe winter range (acres)	93	22	6,425	122	32	11,295	122	32	11,295	93	22	6,425	93	22	6,425	93	22	6,425
Percentage of existing habitat within the Region II big game analysis area	0.09	0.02	6.06	0.12	0.03	10.65	0.12	0.03	10.65	0.09	0.02	6.06	0.09	0.02	6.06	0.09	0.02	6.06
Utah elk crucial winter range (acres)	1,009	386	89,504	805	251	49,473	857	241	17,548	715	257	49,536	1,472	569	72,194	844	551	53,785
Percentage of existing habitat within the Region II big game analysis area	0.03	0.01	2.69	0.02	<0.01	1.49	0.03	<0.01	0.53	0.02	<0.01	1.49	0.04	0.02	2.17	0.03	0.02	2.68
Utah moose occupied habitat (acres)	220	72	22,806	311	125	21,576	0	0	0	790	256	56,727	432	143	29,431	710	255	52,566
Percentage of existing habitat within the Region II big game analysis area	0.02	<0.01	1.73	0.02	<0.01	1.64	0	0	0	0.06	0.02	4.30	0.03	0.01	2.23	0.05	0.02	3.98
Utah Rocky Mountain bighorn sheep crucial yearlong range (acres)	14	6	2,528	2	1	761	2	1	761	151	45	11,796	3	2	694	147	41	11,817
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.14	<0.01	<0.01	0.04	<0.01	<0.01	0.04	<0.01	<0.01	0.66	<0.01	<0.01	0.04	<0.01	<0.01	0.66
Utah desert bighorn sheep occupied habitat (acres)	0	0	0	23	5	1,111	26	6	2,219	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II big game analysis area	0	0	0	<0.01	<0.01	0.10	<0.01	<0.01	0.20	0	0	0	0	0	0	0	0	0
Moose parturition range	0	0	0	35	16	3,073	97	28	8,612	16	5	763	67	19	4,119	47	17	2,087
Percentage of existing habitat within the Region II big game analysis area	0	0	0	<0.01	<0.01	0.78	<0.01	<0.01	2.19	<0.01	<0.01	0.19	<0.01	<0.01	1.05	<0.01	<0.01	0.53
Mule deer parturition range	306	94	30,362	297	119	21,620	191	55	34,017	599	206	43,129	474	138	33,638	727	258	18,542
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.86	<0.01	<0.01	0.62	<0.01	<0.01	12.40	<0.01	<0.01	15.72	<0.01	<0.01	12.26	<0.01	<0.01	0.53
Pronghorn parturition range	492	162	37,132	1,166	277	97,005	1,029	249	84,157	1,014	275	78,747	529	135	42,765	1,014	275	78,747
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	2.60	<0.0	<0.01	6.79	<0.01	<0.01	5.89	<0.01	<0.01	5.51	<0.01	<0.01	2.99	<0.01	<0.01	5.51
Rocky Mountain elk parturition range	44	15	4,707	<1	<1	4,740	<1	<1	5,607	88	25	7,738	0	0	0	88	25	7,738
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.29	<0.01	<0.01	0.29	<0.01	<0.01	0.35	<0.01	<0.01	0.48	0	0	0	<0.01	<0.01	0.48
Small Game and Nongame Species																		
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile habitat (acres)[1]	8,613	1,110	329,494	11,436	1,350	415,597	12,093	1,252	446,512	8,876	1,166	319,535	8,846	1,125	318,382	9,169	1,327	311,279
Percentage of existing habitat within Region II wildlife analysis area	0.08	0.01	3.11	0.11	0.01	3.92	0.11	0.01	4.21	0.08	0.01	3.01	0.08	0.01	3.00	0.09	0.01	2.94
Waterfowl habitat (acres)[2]	131	17	7,415	94	11	5,183	96	12	6,050	64	9	3,843	157	18	6,985	54	10	3,044
Percentage of existing habitat within Region II wildlife analysis area	0.05	<0.01	2.93	0.04	<0.01	2.05	0.04	<0.01	2.39	0.03	<0.01	1.52	0.06	<0.01	2.76	0.02	<0.01	1.20
Relative Collision Potential for Migratory Birds																		
Length of transmission line (miles)[4]	257			345			364			262			266			267		
Raptor Nests (Non-special Status)																		
Number within 1 mile of the reference line[3]	99			107			99			139			101			117		
Bird Habitat Conservation Areas																		
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	761			4,569			4,256			59			534			0		

Table 3.7-29 Summary of Region II Alternative Route Impact Parameters for Wildlife

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Percentage of existing BHCA habitat within the Region II wildlife analysis area	0.04			0.23			0.22			<0.01			0.03			0		
Audubon Important Bird Areas																		
Upper Strawberry Watershed IBA crossed by the 2-mile transmission line corridor (acres)	1,399			0			0			0			0			0		
Percentage of IBA within the Region II wildlife analysis area (acres)	0.90			0			0			0			0			0		

[1] Habitat categories used to calculate acreages of habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, desert shrub, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, other conifer forest, other deciduous forest, pinyon-juniper, riparian, saltbush shrubland, sagebrush shrubland, tundra, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[2] Habitat categories used to calculate acreages of waterfowl habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of 180 raptor nests of unknown species are documented in Region II. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8.5.4, Region II.

[4] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.7-30 Summary of Region II Alternative Route Impact Parameters for USFS Management Indicator Species

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
Species[1]	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect
Ashley National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
White-tailed ptarmigan Habitat category: 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Warbling vireo Habitat categories: 2, 16, 21	0	0	0	0	0	0	0	0	0	5	2	769	93	16	6,531	13	4	966
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	<0.01	<0.01	0.35	0.04	<0.01	2.95	0.01	<0.01	0.44
Song sparrow Habitat categories: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	0	0	0	0	0	0	0	0	0	23	9	3,785	302	37	13,126	65	20	4,989
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	<0.01	<0.01	0.40	0.03	<0.01	1.38	0.01	<0.01	0.52
Lincoln's sparrow Habitat categories: 2, 12, 16, 19, 21	0	0	0	0	0	0	0	0	0	5	2	795	98	16	6,626	13	4	992
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	<0.01	<0.01	0.30	0.04	0.01	2.50	0.01	<0.01	0.37
Fishlake National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
Song sparrow Habitat categories: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	<1	<1	<1	132	16	4,032	989	115	39,973	0	0	0	0	0	0	132	16	4,032
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	<0.01	<0.01	0.30	0.07	<0.01	2.86	0	0	0	0	0	0	<0.01	<0.01	0.32
Hairy woodpecker Habitat categories: 1, 2, 6, 16, 21	<1	<1	<1	94	10	2,255	526	62	20,949	0	0	0	0	0	0	94	10	2,255
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.36	0.08	<0.01	3.31	0	0	0	0	0	0	0.01	<0.01	0.36
Western bluebird Habitat categories: 1, 2, 5, 6, 10, 13, 16, 19, 21	<1	<1	<1	111	13	3,254	593	69	22,989	0	0	0	0	0	0	111	13	3,254
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.37	0.07	<0.01	2.63	0	0	0	0	0	0	0.01	<0.01	0.37
Mountain bluebird Habitat categories: 1, 2, 5, 6, 10, 13, 16, 19, 21	<1	<1	<1	111	13	3,254	593	69	22,989	0	0	0	0	0	0	111	13	3,254
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.37	0.07	<0.01	2.63	0	0	0	0	0	0	0.01	<0.01	0.37
Yellow warbler Habitat categories: 2, 16, 19, 21	<1	<1	<1	94	10	2,261	529	62	20,956	0	0	0	0	0	0	94	10	2,261
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.36	0.08	<0.01	3.30	0	0	0	0	0	0	0.01	<0.01	0.36
MacGillivray's warbler Habitat categories: 2, 6, 16, 19, 21	<1	<1	<1	94	10	2,261	529	62	20,956	0	0	0	0	0	0	94	10	2,261
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.35	0.08	<0.01	3.30	0	0	0	0	0	0	0.01	<0.01	0.35
Brewer's sparrow Habitat category: 18	<1	<1	<1	19	3	769	218	23	7,022	0	0	0	0	0	0	19	3	769
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	<0.01	<0.01	0.28	0.08	<0.01	2.59	0	0	0	0	0	0	<0.01	<0.01	0.28
Lincoln's sparrow Habitat Categories: 2, 12, 16, 19, 21	<1	<1	<1	94	10	2,261	529	62	20,956	0	0	0	0	0	0	94	10	2,261
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.35	0.08	<0.01	3.28	0	0	0	0	0	0	0.01	<0.01	0.35

Table 3.7-30 Summary of Region II Alternative Route Impact Parameters for USFS Management Indicator Species

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
Species[1]	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect
Manti-LaSal National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
Abert's squirrel Habitat category: 5	3	2	470	185	37	6,269	0	0	0	66	13	2,590	3	2	537	3	2	537
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	0.16	0.06	0.01	2.16	0	0	0	0.02	<0.01	0.89	<0.01	<0.01	0.19	<0.01	<0.01	0.19
Uintah-Wasatch-Cache National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
American beaver Habitat categories: 15, 21	1	<1	3	<1	<1	31	0	0	0	<1	<1	24	1	<1	3	1	<1	3
Percentage of existing habitat within the Region II MIS Analysis Area	0.01	<0.01	0.04	<0.01	<0.01	0.37	0	0	0	<0.01	<0.01	0.29	<0.01	<0.01	0.04	<0.01	<0.01	0.04

[1] MIS that are classified as special status species are presented in Section 3.8, Special Status Wildlife Species.

Note: Please refer to Section 3.8.5.4 for indirect impacts by vegetation community/habitat category.

Table 3.7-31 Summary of Existing Conditions by Alternative within Region II

Alternative	Length (miles)	Length of Greenfield Construction	Length of Co-located Construction	Miles of Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
II-A	257	32	225	1,256	4.89
II-B	345	156	189	1,364	3.95
II-C	364	157	208	1,645	4.52
II-D	262	151	110	946	3.61
II-E	266	45	222	1,289	4.85
II-F	267	121	146	1,084	4.06

Nongame Species

The types of impacts to nongame species under Alternative II-A generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-A would result in the construction and operation disturbance of 8,613 acres and 1,110 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.08 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-A would result in the construction and operation disturbance of 8,613 acres and 1,110 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.08 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-A is found in **Tables 3.7-29** and **3.7-31**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 99 raptor nests that are not classified as special status have been identified within 1 mile of the reference line along Alternative II-A (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-A would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-A.

Table 3.7-32 Non-special Status Raptor Nests Within 1 Mile of the Reference Line in Region II

Species	Alternative II-A (Applicant Proposed)	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F (Agency Preferred)	Castle Dale Alternative Connector	Price Alternative Connector	Lynndyl Alternative Connector	IPP East Alternative connector	Highway 191 Alternative Connector	Cedar Knoll Micro-siting Option 1	Cedar Knoll Micro-siting Option 2	Comparable Portion of Alternative II-F	Emma Park Alternative Variation	Comparable Portion of Alternative II-F	Strawberry IRA Micro-siting Option 1	Strawberry IRA Micro-siting Option 2	Strawberry IRA Micro-siting Option 3	Strawberry IRA Comparable Portion of Alternative II-A	Cedar Knoll IRA Micro-siting Option 1	Cedar Knoll IRA Micro-siting Option 2	Cedar Knoll Comparable Portion of alternative II-A
Osprey	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	0	0	0
Cooper's hawk	0	3	2	9	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-tailed hawk	15	9	1	28	20	15	0	6	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
American kestrel	0	0	1	4	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great horned owl	1	0	2	7	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common raven	1	0	2	3	0	3	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0
Unknown raptor species	80	95	91	87	77	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bald eagle winter roosts	6	0	0	2	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	99	107	99	139	101	117	0	6	0	0	0	1	1	1	0	0	3	3	3	3	0	0	0

Note: Each alternative route is comprised of unique segments. Segments may be included in more than one alternative route. The total nests for each alternative route will not add to the total number of nests for the region. Bald eagle winter roosts are not included in the total.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010, 2012; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012; Manti-LaSal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Strawberry IRA Micro-siting Options

TWE has developed three potential options to avoid or minimize the crossing of national forest IRAs along Alternative II-A. These are referred to as Strawberry IRA micro-siting options 1, 2, and 3. These three micro-siting options would result in similar direct impacts to wildlife habitat in comparison to Alternative II-A. Micro-siting options 2 and 3 would reduce the amount of habitat fragmentation in comparison to Alternative II-A as they would be collocated adjacent to an existing 345-kV transmission line for approximately 4 miles. Any other differences in impacts to wildlife habitat are anticipated to be negligible in comparison to Alternative II-A.

Alternative II-B

Alternative II-B Habitat Disturbance and Fragmentation

Alternative II-B would cross approximately 345 miles of wildlife habitat in Colorado and Utah. Approximately 189 miles (55 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-B 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-B in western Colorado include roads from several livestock operations and oil infrastructure located within the 2-mile corridor, and the town of Rangely, Colorado. Wildlife habitat along Alternative II-B in Rio Blanco County, Colorado, also is fragmented by the existence of State Highway 64, which parallels the 2-mile transmission line corridor for several miles east of Rangely, and State Highway 138, which crosses the corridor south of Rangely. Energy development and infrastructure fragments wildlife habitat in the Alternative II-B corridor along the rest of the route through Rio Blanco County. Existing disturbance along Alternative II-B is limited mostly to county and USFS maintenance roads in Garfield and Mesa counties, Colorado, until it reaches I-70 and follows the I-70 corridor into Utah. This section of Alternative II-B follows I-70 across all of Grand County, Utah, and is highly fragmented by the interstate, the crossing of multiple state highways and county roads, as well as the communities of Harley Dome, Thompson, and Crescent Junction. Major disturbance also is caused by the Union Pacific Railroad that weaves in and out of the 2-mile transmission line corridor for approximately 40 miles to the border of Emery County. Alternative II-B parallels U.S. Highway 6/191 north from I-70 to the border of Carbon County where the 2-mile transmission line corridor heads west. Disturbance along this stretch of Alternative II-B include I-70, U.S. Highway 6/191, the Union Pacific Railroad, Green River Municipal Airport and the community of Woodside, Utah. Pivot agriculture, oil and gas infrastructure, and State Highway 31 causes most disturbance along this portion of the route until Alternative II-B reaches the Manti-La Sal National Forest where disturbance and fragmentation is limited to USFS and county roads to the border of Sanpete County. Wildlife disturbance in Sanpete County include the towns of Mount Pleasant, and Fountain Green, Utah, and State Highways 146 and 132. The outskirts of Nephi, Utah, heavy agriculture, I-15, and State Highway 132 cause fragmentation in Juab County. The final stretch of Alternate II-B in Millard County is disturbed by State Highways 132, 125, and 174. U.S. Highway 6 and the Union Pacific Railroad also fragment the 2-mile transmission line corridor. Pivot agriculture and the Intermountain Power Plant also exist along the route where it terminates west of the town of Delta, Utah. The remaining segments of Alternative II-B are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 1,364 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the fifth highest existing road density within the 2-mile transmission line corridor amongst Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Rocky Mountain bighorn sheep crucial winter range would not be impacted but pronghorn and desert bighorn sheep crucial winter range would be impacted under Alternative II-B. Alternative II-B would result in the construction and operation disturbance of 11,436 acres and 1,350 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-B also would result in the construction disturbance of 94 acres and operation disturbance of 11 acres of waterfowl habitat. These areas represent 0.04 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-B would result in the construction and operation disturbance of 11,436 acres and 1,350 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-B would result in the construction and operation disturbance of 11,436 acres and 1,350 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-B is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 107 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-B (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-B.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-C

Alternative II-C Habitat Disturbance and Fragmentation

Alternative II-C would cross approximately 364 miles of wildlife habitat in Colorado and Utah. Approximately 208 miles (57 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-C 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative II-C follows the same route as Alternative II-B (see above) until the corridor heads west near Woodside, Utah, in Emery County. Most of the existing disturbance and fragmentation in the remainder of Emery County exists around the town of Emery. Disturbance includes the town of Emery, State Highway 10, and multiple agricultural operations along the route. There also is an open pit mine within the 2-mile transmission line corridor south of Castle Dale, Utah. Disturbance and fragmentation are minimized in the mountainous regions of Sevier County consisting mainly of county and USFS roads. However, I-70 is crossed twice and part of the town of Aurora, Utah, occurs within the 2-mile transmission line corridor. Wildlife habitat along Alternative II-C is highly fragmented throughout most of Millard County beginning with the 2-mile transmission line corridor following U.S. Highway 50 to Scipio. At this point, the route tracks west and crosses the I-15 corridor, and skirts the southern boundary of the Fishlake National Forest to where it follows U.S. Highway 50 to the Delta metropolitan area. The remaining portions of the Alternative II-C corridor are moderately fragmented by county roads, low density oil and gas and livestock operations, agriculture, and private residences. A total of 1,645 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the third highest existing road density within the 2-mile transmission line corridor amongst Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Pronghorn crucial winter range would be impacted under Alternative II-C. Alternative II-C would result in the construction and operation disturbance of 12,093 acres and 1,252 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-C also would result in the construction disturbance of 96 acres and operation disturbance of 12 acres of waterfowl habitat. These areas represent 0.04 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-C would result in the construction and operation disturbance of 12,093 acres and 1,252 acres, respectively of potentially suitable small mammal

and reptile habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-C would result in the construction and operation disturbance of 12,093 acres and 1,252 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-C is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 99 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-C (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-D

Alternative II-D Habitat Disturbance and Fragmentation

Alternative II-D would cross approximately 262 miles of wildlife habitat in Colorado and Utah. Approximately 110 miles (42 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-D 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-D in western Colorado and eastern Utah include several livestock operation roads, oil and gas infrastructure located within the 2-mile transmission line corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-D in Moffat County, Colorado, also is fragmented by the existence of U.S. Highway 40, which parallels the 2-mile transmission line corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include heavy oil and gas operations, livestock operations, and center pivot agriculture operations near the town of Jensen. In Duchesne County, Utah, sources of disturbance include oil and gas operations, livestock operations, and center pivot agriculture operations. Disturbance and fragmentation increases in western Carbon County

with an increased presence of oil and gas infrastructure, and the crossing of several major roadways (U.S. Highways 191 and 6) in this section of Alternative II-D. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, Utah, and the Intermountain Power Plant located north of Delta, Utah. A total of 946 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the lowest existing road density within the 2-mile transmission line corridor among Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Pronghorn crucial winter range would be impacted under Alternative II-D. Alternative II-D would result in the construction and operation disturbance of 8,876 acres and 1,166 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.08 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-D also would result in the construction disturbance of 64 acres and operation disturbance of 9 acres of waterfowl habitat. These areas represent 0.03 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-D generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-D would result in the construction and operation disturbance of 8,876 acres and 1,166 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.08 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-D would result in the construction and operation disturbance of 8,876 acres and 1,166 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.08 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-D is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 139 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-D (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design

features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-D would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-D.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-E

Alternative II-E Existing Habitat Disturbance and Fragmentation

Alternative II-E would cross approximately 266 miles of wildlife habitat in Colorado and Utah. Approximately 222 miles (83 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-E 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-E in western Colorado and eastern Utah include several livestock operations, a major surface coal mining operation located within the 2-mile transmission line corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-E in Moffat County, Colorado, also is fragmented by the existence of U.S. Highway 40, which parallels the 2-mile corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include oil and gas operations, livestock operations, and center pivot agriculture operations near the town of Jensen. In Duchesne County, Utah, sources of disturbance include the crossing of U.S. Highway 40, oil and gas operations, livestock operations, and center pivot agriculture operations, and the communities of Bridgeland, Ioca, and Roosevelt. In Utah County, Utah, the major source of fragmentation within the 2-mile transmission line corridor is State Highway 89 and U.S. Highway 6, which parallel Alternative II-E for approximately 17 miles. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, and the Intermountain Power Plant located north of Delta, Utah. A total of 1,289 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the second highest existing road density within the 2-mile transmission line corridor among Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Pronghorn crucial winter range would be impacted under Alternative II-E. Alternative II-E would result in the construction and operation disturbance of 8,846 acres and 1,125 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.08 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-E also would result in the construction disturbance of 157 acres and operation disturbance of 18 acres of waterfowl habitat. These areas represent 0.06 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-E generally would be same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-E would result in the construction and operation disturbance of 8,846 acres and 1,125 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.08 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-E would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-E would result in the construction and operation disturbance of 8,846 acres and 1,125 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.08 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-E is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 101 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-E (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-E would be limited to habitat loss, fragmentation, mortality from collisions, negligible potential for electrocution, and disturbance during routine maintenance activities.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-F (Agency Preferred)

Alternative II-F Habitat Disturbance and Fragmentation

Alternative II-F would cross approximately 267 miles of wildlife habitat in Colorado and Utah. Approximately 146 miles (55 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-F 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-F in western Colorado and eastern Utah include several livestock operations, oil and gas infrastructure located within the 2-mile transmission line corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-F in Moffat County, Colorado, also is

fragmented by the existence of U.S. Highway 40, which parallels the 2-mile transmission line corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include heavy oil and gas operations, livestock operations, and center pivot agriculture operations near the town of Roosevelt. In Duchesne County, Utah, sources of disturbance also include oil and gas operations, livestock operations, and center pivot agriculture operations. In Utah County, Utah, the major source of fragmentation within the 2-mile transmission line corridor is State Highway 89 and U.S. Highway 6, which parallel Alternative II-F for approximately 17 miles. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, Utah, and the Intermountain Power Plant located north of Delta, Utah. The remaining segments of Alternative II-F are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 1,084 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the fourth highest existing road density within the 2-mile transmission line corridor among Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-F generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Sensitive big game habitats that would be impacted under Alternative II-F include mule deer crucial winter range, elk severe winter range, pronghorn year-long and seasonal crucial range, and Rocky mountain bighorn sheep year-long crucial range. Alternative II-F would result in the construction and operation disturbance of 9,169 acres and 1,327 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.09 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region II wildlife analysis area. Alternative II-F also would result in the construction disturbance of 54 acres and operation disturbance of 10 acres of waterfowl habitat. These areas represent 0.02 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-F would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-F generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-F would result in the construction and operation disturbance of 9,169 acres and 1,327 acres, respectively, of potential small mammal and reptile habitat. These areas represent 0.09 percent and 0.01 percent of the potential small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-F generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-F would result in the construction and operation disturbance of 9,169 acres and 1,327 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.09 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-F is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or

exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 117 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-F (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and migratory birds along Alternative II-F would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-F.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Cedar Knoll IRA Micro-siting Options

TWE has developed two potential options to avoid or minimize the crossing of national forest IRAs along Alternatives II-E and II-F. These are referred to as Cedar Knoll micro-siting options 1, and 2. Both of these micro-siting options would result in similar acreages of direct impacts to wildlife habitat in comparison to Alternatives II-E and II-F. However, both of these micro-siting options would be collocated adjacent to an existing 345-kV transmission line while Alternatives II-E and II-F would not be collocated with existing transmission in this area. This aspect of the micro-siting options would result in reduced habitat fragmentation in comparison to Alternatives II-E and II-F. All other differences in impacts to wildlife habitat are anticipated to be negligible in comparison to Alternatives II-E and II-F.

<u>USFS Management Indicator Species</u>

Four national forests would be crossed by the Project in Region II. A total of 12 wildlife species are identified as MIS that are not otherwise classified as special status species. Impacts to these species are presented in **Table 3.7-30**.

<u>Alternative Variation in Region II</u>

Emma Park Alternative Variation

Multiple routes have been developed in the Emma Park area north of Price, Utah to avoid occupied greater sage-grouse habitat. One route is aligned east-west and is analyzed as the Emma Park Alternative Variation. This variation and the comparable portion of Alternative II-F do not cross the Fishlake or Manti-LaSal national forests. **Table 3.7-33** summarizes Region II Alternative Variation impact parameters for wildlife species.

Table 3.7-33 Summary of Region II Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Emma Park Alternative Variation			Comparable Portion of Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species						
Utah mule deer crucial winter range (acres)	3	<1	83	20	6	798
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
Utah moose occupied habitat (acres)	609	210	34,828	582	213	25,435
Percentage of existing habitat within the Region II big game analysis area	0.05	0.02	2.64	0.04	0.02	1.93
Utah elk crucial winter range (acres)	308	110	16,913	58	16	1,373
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.51	<0.01	<0.01	0.04
Utah Rocky Mountain bighorn sheep crucial yearlong range (acres)	0	0	0	<1	<1	20
Percentage of existing habitat within the Region II big game analysis area	0	0	0	<0.01	<0.01	<0.01
Small Game and Nongame Species						
Small game and nongame potential habitat (acres)[1]	1,250	215	35,632	1,182	234	27,323
Percentage of potential habitat within the Region II wildlife analysis area	0.01	<0.01	0.34	0.01	<0.01	0.26
Waterfowl						
Waterfowl potential habitat (acres)[2]	7	1	141	<1	<1	9
Percentage of potential habitat within the Region II wildlife analysis area	<0.01	<0.01	0.06	<0.01	<0.01	<0.01
Relative Collision Potential for Migratory Birds						
Length of transmission line (miles)[3]	35			32		
Raptor Nests (Non-special Status)						
Number of raptor nests within 1 mile of the reference line[4]	0			0		
Bird Habitat Conservation Areas						
BHCAs crossed by the 250 foot-wide transmission line ROW (acres)	20	5	257	0	0	0
Percentage of existing BHCA habitat within the Region II wildlife analysis area	<0.01	<0.01	<0.01	0	0	0
Audubon Important Bird Areas						
IBA (acres) within 2-mile transmission line corridor	0	0	0	0	0	0
Ashley National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species						
White-tailed ptarmigan potential habitat (acres) Habitat category[5]: 20	0	0	0	0	0	0
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0
Warbling Vireo potential habitat (acres) Habitat categories: 2, 16, 21	0	0	0	9	2	197

Table 3.7-33 Summary of Region II Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Emma Park Alternative Variation			Comparable Portion of Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	<0.01	<0.01	0.09
Song sparrow potential habitat (acres) Habitat categories: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	<1	<1	<1	45	12	1,204
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	<0.01	<0.01	0.11
Lincoln's sparrow potential habitat (acres) Habitat categories: 2, 12, 16, 19, 21	0	0	0	9	2	197
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	<0.01	<0.01	0.07
Uintah-Wasatch-Cache National Forest management Indicator Species Not Otherwise Analyzed as Special Status Species						
American beaver potential habitat (acres) Habitat categories: 15, 21	0	0	0	<1	<1	3
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	<0.01	<0.01	<0.01

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities in included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of disturbance to potential waterfowl habitat include herbaceous wetland, open water, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Length refers to length of 600-kV transmission line and serves as a metric for avian collision potential.

[4] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species.

[5] Habitat categories refers to vegetation communities (by number) as presented in **Table 3.7-2.**

Alternative Connectors in Region II

If utilized, the Castle Dale, Price, Lynndyl, Highway 191, and IPP East alternative connectors would include minimal increases of total habitat disturbance relative to the total impacts associated with Region II alternatives.

TWE has developed alternative reference lines in the Emma Park area north of Price, Utah. The Highway 191 Alternative Connector was identified to reduce, avoid, or minimize potential impacts to greater sage-grouse.

The Lynndyl Alternative Connector would impact mule deer crucial winter range.

Table 3.7-34 summarizes impacts associated with the alternative connectors in Region II.

Table 3.7-34 Summary of Region II Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Lynndyl Alternative Connector (Alternatives II-B and II-C)	• Approximately 24 miles in length.[1] • Approximately 266 acres of construction, 63 acres of operation, and 24,932 acres of indirect impacts to mule deer crucial winter range would occur. • Approximately 793 acres of construction, 69 acres of operation, and 28,059 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 7 acres of indirect impacts to waterfowl potential habitat would occur. • Fishlake National Forest would be crossed. Potential impacts to MIS species would range from 15 acres of construction and 2 acres of operation to song sparrow to 2 acres of construction and <1 acre of operation to Brewer's sparrow. • There are 688 acres of the Sevier Bridge/Chicken Creek BHCA within the 250 foot-wide transmission line ROW. • No raptor nests are within 1 mile of the reference line.
IPP East Alternative Connector (Alternatives II-A and II-B)	• Approximately 3 miles in length.[1] • Approximately 35 acres of construction impacts and 7 acres of operation impacts to pronghorn crucial yearlong range would occur. • Approximately 86 acres of construction, 7 acres of operation, and 2,317 acres of indirect impacts to small game and nongame potential habitat would occur. • No raptor nests are within 1 mile of the reference line.
Castle Dale Alternative Connector	• Approximately 11 miles in length.[1] • Approximately 38 acres of construction, 10 acres of operation, and 2,282 acres of indirect impacts to mule deer crucial winter range would occur. • Approximately 1 acre of indirect impacts to moose occupied habitat would occur. • Approximately 348 acres of construction, 45 acres of operation, and 12,019 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 6 acres of construction, 1 acre of operation, and 294 acres of indirect impacts to waterfowl potential habitat would occur. • No raptor nests are within 1 mile of the reference line.
Highway 191 Alternative Connector	• Approximately 5 miles in length.[1] • Approximately 119 acres of construction, 38 acres of operation, and 3,134 acres of indirect impacts to Utah moose occupied habitat would occur. • Approximately 22 acres of construction, 5 acres of operation, and 379 acres of indirect impacts to Utah elk crucial winter range would occur. • Approximately 175 acres of construction, 36 acres of operation, and 3,035 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 1 acre of indirect impacts to waterfowl potential habitat would occur. • No raptor nests are within 1 mile of the reference line.

Table 3.7-34 Summary of Region II Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Price Alternative Connector	• Approximately 18 miles in length.[1] • Approximately 56 acres of construction, 15 acres of operation, and 3,419 acres of indirect impacts to pronghorn crucial yearlong range would occur. • Approximately 0.1 acres of construction, 0.02 acres of operation, and 3 acres of indirect impacts to pronghorn substantial yearlong range would occur. • Approximately 246 acres of construction, 72 acres of operation, and 19,529 acres of indirect impacts to mule deer crucial winter range would occur. • Approximately 280 acres of construction, 81 acres of operation, and 21,262 acres of indirect impacts to elk crucial winter range would occur. • Approximately 6 acres of construction, 3 acres of operation, and 1,334 acres of indirect impacts to moose occupied habitat would occur. • Approximately 609 acres of construction, 75 acres of operation, and 19,623 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 3 acres of construction, 0.4 acres of operation, and 87 acres of indirect impacts to waterfowl potential habitat would occur. • Six raptor nests are within 1 mile of the reference line. • Forty-two acres of the Summerhouse Spring BHCA are within the 250 foot-wide transmission line ROW.

[1] Length refers to length of 600-kV transmission lines, and serves as a proxy metric for avian collision potential.

[2] Indirect impacts for these species can be calculated utilizing the vegetation communities presented in Section 3.5, Vegetation, and on **Table 3.7-14**.

Region II Conclusion

Based on a comparison of impact parameters for Region II alternatives, potential construction and operation impacts to wildlife would be varied across all alternatives as shown in **Table 3.7-29**. Alternative II-F would result in the greatest direct and indirect impacts to big game habitat in comparison to the other Region II alternatives. Alternative II-C would result in the greatest direct and indirect impacts to small game habitat in comparison to the other Region II alternatives (**Table 3.7-29**). Alternative II-B would result in the greatest direct and indirect impacts to migratory bird habitat in comparison to the other Region II alternatives (**Table 3.7-29**). Alternative II-D would result in the greatest direct and indirect impacts to existing raptor nests in comparison to the other Region II alternatives (**Table 3.7-29**). Alternative II-E could also result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-12**. Although potential impacts to these separate groups of species are varied, Alternative II-C would result in the greatest potential impacts to wildlife in terms of the total acreage of construction and operation impacts combined. Potential impacts to wildlife species present within the five national forests also would be greatest for Alternative II-C as shown in **Tables 3.7-28** and **3.7-30**. Even though the greatest level of impacts are associated with Alternative II-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.4 and **Appendix C**).

3.7.6.5 Region III

Table 3.7-35 provides a tabulation of impacts associated with the alternative routes in Region III. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Table 3.7-35 Summary of Existing Conditions by Alternative within Region III

Alternative	Length (miles)	Length of Greenfield Construction	Length of Co-located Construction	Miles of Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
III-A	276	73	203	982	3.55
III-B	285	140	145	1,045	3.68
III-C	308	96	213	1,110	3.60

Alternative III-A (Applicant Proposed)

Alternative III-A Habitat Disturbance and Fragmentation

Alternative III-A would cross approximately 276 miles of wildlife habitat in Utah. Approximately 203 miles (74 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-35**. Existing conditions within the Alternative III-A 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. The section of Alternative III-A crossing Millard County is fragmented and disturbed by existing BLM maintenance roads, several county roads, existing oil and gas operations, and U.S. Highway 6. Wildlife habitat along the III-A route in Beaver County is fragmented by BLM and county roads, as well as oil and gas infrastructure. The Alternate III-A corridor also crosses State Highway 21, an abandoned iron mine site located northeast of Milford, Utah, and a Union Pacific Rail line before entering into Iron County. Major causes of disturbance in Iron County include agricultural pivots, and oil and gas infrastructure. The Alternative III-A route also crosses State Highway 56 and a section of the Union Pacific Railroad before continuing into Washington County, Utah. The Alternative III-A route is collocated with existing transmission lines throughout Washington County and into Nevada and disturbance and fragmentation is mostly limited to USFS roads as the route enters the mountains. Some agriculture, the Veyo Compressor Station (located west of Veyo, Utah) and the crossing of State Highway 18 also adds to habitat disturbance and fragmentation along this section of the route. The remaining segments of Alternative III-A through Nevada are moderately disturbed by county roads, low density oil and gas and livestock operations, and private residences. However, fragmentation does increase along this stretch as the route approaches Las Vegas, Nevada, and crosses I-15 several times, as well as some smaller state highways. A total of 982 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-35**. This represents the lowest existing road density within the 2-mile transmission line corridor among Region III alternatives.

Key Parameters Summary

Game Species

Alternative III-A would result in direct disturbance to mule deer crucial winter range in Utah and desert bighorn sheep occupied habitat in Nevada (**Table 3.7-36**). Implementation of the BLM, UDWR, and USFS restriction to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would prevent direct impacts to wintering big game species. Alternative III-A would result in the construction and operation disturbance of 9,320 acres and 979 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.13 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region III wildlife analysis area. Alternative III-A also would result in the construction disturbance of 249 acres and operation disturbance of 26 acres of waterfowl habitat. These areas represent 0.12 percent and 0.01 percent of the available waterfowl habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-36 Summary of Region III Alternative Route Impact Parameters for Wildlife

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species									
Nevada pronghorn occupied habitat (acres)	0	0	0	31	7	1,860	373	95	36,278
Percentage of existing habitat within the Region III big game analysis area	0	0	0	<0.01	<0.01	0.12	0.02	<0.01	2.40
Utah pronghorn crucial yearlong range (acres)	1,627	378	201,853	1,897	433	217,375	1,868	439	223,170
Percentage of existing habitat within the Region III big game analysis area	0.03	<0.01	3.72	0.03	<0.01	4.00	0.03	<0.01	4.11
Nevada mule deer occupied habitat (acres)	0	0	0	2	1	675	84	21	8,591
Percentage of existing habitat within the Region III big game analysis area	0	0	0	<0.01	<0.01	0.27	0.03	<0.01	3.43
Utah mule deer crucial winter range (acres)	185	51	13,692	0	0	0	0	0	0
Percentage of existing habitat within the Region III big game analysis area	0.02	<0.01	1.68	0	0	0	0	0	0
Nevada desert bighorn sheep occupied habitat (acres)	102	31	7,605	140	40	12,203	106	30	19,332
Percentage of existing habitat within the Region III big game analysis area	0.02	<0.01	1.35	0.02	<0.01	2.16	0.02	<0.01	3.42
Utah desert bighorn sheep occupied habitat (acres)	4	2	958	0	0	0	0	0	0
Percent of existing habitat within the Region III big game analysis area	<0.01	<0.01	1.41	0	0	0	0	0	0
Small Game and Nongame Species									
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile habitat (acres)[1]	9,320	979	374,780	9,502	862	375,681	10,327	940	435,065
Percentage of existing habitat within the Region III wildlife analysis area	0.13	0.01	5.26	0.13	0.01	5.27	0.14	0.01	6.11
Waterfowl habitat (acres)[2]	249	26	11,389	360	30	14,704	239	23	12,932
Percentage of existing habitat within the Region III wildlife analysis area	0.12	0.01	5.33	0.17	0.01	6.89	0.11	0.01	6.06
Relative Collision Potential for Migratory Birds									
Length of transmission line (miles)[4]	276			285			308		
Raptor Nests (Non-special Status)									
Number within 1 mile of the reference line[3]	254			129			137		
Bird Habitat Conservation Areas									
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	473			131			199		
Percentage of existing BHCAs within the Region III wildlife analysis area	0.07			0.02			0.03		

Table 3.7-36 Summary of Region III Alternative Route Impact Parameters for Wildlife

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Audubon Important Bird Areas									
Pahranagat Valley Complex IBA (acres within 2-mile transmission line corridor)	0			0			188		
Percentage of existing IBA habitat within the Region III wildlife analysis area	0			0			0.31		

[1] Habitat categories used to calculate acreages of habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[2] Habitat categories used to calculate acreages of waterfowl habitat disturbance include herbaceous wetland, open water, riparian, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of 74 raptor nests of unknown species are documented in Region III. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8.5.5, Region III.

[4] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Nongame Species

The types of impacts to nongame species under Alternative III-A generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Alternative III-A would result in the construction and operation disturbance of 9,320 acres and 979 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.13 percent and 0.01 percent of the available small mammal and reptile habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative III-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative III-A would result in the construction and operation disturbance of 9,320 acres and 979 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.13 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region III wildlife analysis area. The length of Alternative III-A is found in **Table 3.7-36**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 254 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative III-A (**Table 3.7-37**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative III-A would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative III-A.

Table 3.7-37 Non-special Status Raptor Nests Within 1 Mile of the Reference Line in Region III

Species	Alternative III-A	Alternative III-B	Alternative III-C	Ox Valley East Alternative Variation	Ox Valley West Alternative Variation	Ox Valley Alternative Variation Comparative Portion	Pinto Alternative Variation	Pinto Alternative Variation Comparative Portion	Avon Alternative Connector	Moapa Alternative Connector
Red-tailed hawk	15	7	6	0	0	4	2	7	0	0
Common raven	91	43	49	0	0	2	2	7	4	0
Osprey	1	0	0	0	0	0	0	0	0	0
Unknown raptor species	147	79	82	1	1	11	3	50	1	0
Totals	254	129	137	1	1	17	7	64	5	0

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010, 2012; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012; Manti-LaSal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative III-B (Agency Preferred)

Alternative III-B Habitat Disturbance and Fragmentation

Alternative III-B would cross approximately 285 miles of wildlife habitat in Utah. Approximately 145 miles (51 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-36**. Existing conditions within the Alternative III-B 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. The section of Alternative III-B crossing Millard County is fragmented and disturbed by existing BLM maintenance roads, several county roads, existing oil and gas operations, and U.S. Highway 6. Wildlife habitat along the Alternative III-B route in Beaver County is moderately fragmented by BLM and county roads, as well as oil and gas infrastructure. Alternate III-B also crosses State Highway 21, an abandoned iron mine site located northeast of Milford, Utah, and a Union Pacific rail line before entering into Iron County. Major causes of disturbance in Iron County include the towns of Sun Valley, Beryl, and Modena, Utah, and the associated agricultural pivots, ranches and county roads. The Alternative III-B route also crosses State Highway 56 and a section of the Union Pacific Railroad that follows the 2-mile transmission line corridor from Sun Valley, Utah, to the boundary of Lincoln County, Nevada. A Union Pacific rail line continues to fragment the Alternate III-B corridor for approximately 16 miles into Nevada where the rail line heads west at Barclay, Nevada. The remaining segments of Alternative III-B through Nevada are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. However, disturbance does increase along this stretch as Alternative III-B enters Clark County and intersects State Highway 168 at Moapa Town, Nevada. As the route approaches Las Vegas, Nevada, the 2-mile transmission line corridor crosses I-15 several times, as well as smaller state highways and metropolitan roadways. A total of 1,045 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-35**. This represents the highest existing road density within the 2-mile transmission line corridor among Region III alternatives.

Game Species

The types of impacts to big game species under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Pronghorn crucial winter range in Nevada also would be impacted under Alternative III-B. Alternative III-B would result in the construction and operation disturbance of 9,502 acres and 862 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.13 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region III wildlife analysis area. Alternative III-B also would result in the construction disturbance of 360 acres and operation disturbance of 30 acres of waterfowl habitat. These areas represent 0.17 percent and 0.01 percent of the available waterfowl habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative III-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Alternative III-B would result in the construction and operation disturbance of 9,502 acres and 862 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.13 percent and 0.01 percent of the available small mammal and reptile habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-B would result in the construction and operation disturbance of 9,502 acres and 862 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.13 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region III wildlife analysis area. The length of Alternative III-B is found in **Table 3.7-36**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 129 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative III-B. These are presented in **Table 3.7-37**. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, there would be negligible potential for electrocution and remaining Project construction and operation impacts to raptors and other migratory birds under Alternative III-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative III-C

Alternative III-C Habitat Disturbance and Fragmentation

Alternative III-C would cross approximately 308 miles of wildlife habitat in Utah. Approximately 213 miles (69 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-35**. Existing conditions within the Alternative III-C 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. The section of Alternative III-C crossing Millard County is fragmented and disturbed by existing BLM maintenance roads, several county roads, existing oil and gas operations, and U.S. Highway 6. Wildlife habitat along the Alternative III-C route in Beaver County is moderately fragmented by BLM and county roads, as well as oil and gas infrastructure. Alternative III-C also crosses State Highway 21, an abandoned iron mine site located

northeast of Milford, Utah, and a Union Pacific rail line before entering into Iron County. Major causes of disturbance in Iron County include the towns of Sun Valley, Beryl, and Modena, Utah, and the associated agricultural pivots, ranches and county roads. The Alternative III-C route also crosses State Highway 56 and a section of the Union Pacific Railroad that follows the 2-mile transmission line corridor from Sun Valley, Utah, to the boundary of Lincoln County, Nevada. Alternative III-C is parallel to U.S. Highway 93 for a majority of this section of the corridor. The remaining segments of Alternative III-C through Lincoln County are sporadically fragmented by county roads, low density oil and gas and livestock operations, and private residences. The route continues to follow U.S. Highway 93 until infrastructure from Las Vegas, Nevada (I-15, Harry Allen Generating Station, Silverhawk Generating Station and Power Plant) causes nearly continuous disturbance and fragmentation to the terminus of Alternative III-C just north of the city. A total of 1,110 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-35**. This represents the second highest existing road density within the 2-mile transmission line corridor among Region III alternatives.

Game Species

The types of impacts to big game species under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Additional mule deer and pronghorn crucial winter ranges would be impacted under Alternative III-C. Alternative III-C would result in the construction and operation disturbance of 10,327 acres and 940 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.14 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region III wildlife analysis area. Alternative III-C also would result in the construction disturbance of 239 acres and operation disturbance of 23 acres of waterfowl habitat. These areas represent 0.11 percent and 0.01 percent of the available waterfowl habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative III-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Alternative III-C would result in the construction and operation disturbance of 10,327 acres and 940 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.14 percent and 0.01 percent of the available small mammal and reptile habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative III-C would result in the construction and operation disturbance of 10,327 acres and 940 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.14 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region III wildlife analysis area. The length of Alternative III-B is found in **Table 3.7-36**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 137 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative III-C (**Table 3.7-37**).

In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative III-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative III-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

USFS Management Indicator Species

The Dixie National Forest is crossed by the Project in Region III. Two wildlife species, the wild turkey and the northern flicker, are identified as MIS that are not otherwise classified as special status species. Only Alternative III-A would cross the forest, impacting 336 acres of potential wild turkey habitat and 298 acres of potential northern flicker habitat during construction. Operation would impact 59 acres of potential wild turkey habitat and 54 acres of potential northern flicker habitat. Impacts to Dixie National Forest MIS not otherwise classified as special status species are listed in **Table 3.7-38**. Impacts to MIS also classified as special status are discussed in Section 3.8, Special Status Wildlife Species.

Table 3.7-38 Summary of Region III Alternative Route Impact Parameters for USFS MIS

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
Species	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Dixie National Forest MIS not Otherwise Analyzed as Special Status Species[1]									
Wild turkey potential habitat (acres) Habitat categories: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	336	59	15,286	0	0	0	0	0	0
Percentage of potential habitat within the Region III MIS Analysis Area	0.03	<0.01	0.81	0	0	0	0	0	0
Northern flicker potential habitat (acres) Habitat categories: 1, 2, 5, 6, 12, 16, 21	298	54	14,193	0	0	0	0	0	0
Percentage of potential habitat within the Region III MIS Analysis Area	0.02	<0.01	0.75	0	0	0	0	0	0

[1] There are no habitat impacts to northern goshawk anticipated from Alternative III-A.

Note: Please refer to Section 3.8.5.5 for indirect impacts by vegetation community/habitat type.

Region III Conclusion

Based on a comparison of impact parameters for Region III alternatives, potential construction and operation impacts to wildlife would be varied across all alternatives as shown in **Table 3.7-36**. Alternative III-C would result in the greatest direct and indirect impacts to big game, small game, and non-game habitat in comparison to the other Region III alternatives. Alternative III-A would result in the greatest impacts to existing raptor nests and BHCAs in comparison to the other Region III alternatives (**Table 3.7-36**). Alternatives III-A and III-B also could result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-15**. Potential impacts to wildlife species present within the Dixie National Forest would be greatest for Alternative III-A as shown in **Table 3.7-38**. Although potential impacts to these separate groups of species are varied, Alternative III-C would result in the greatest potential impacts to wildlife in terms of the total acreage of construction and operation impacts combined. Even though the greatest level of impacts are associated with Alternative III-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.5 and **Appendix C**).

Alternative Variations in Region III

Table 3.7-39 summarizes impacts associated with the alternative variations in Region III. Impacts to big game species under the three alternative variations in Region III would generally be the same as the comparable portions of Alternatives III-A, but would differ in the amount of habitat disturbed (**Table 3.7-39**). Similar to the comparable portions of Alternatives III-A, after considering design features and mitigation measures, impacts to game and nongame species from Project construction and operation would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

The Ox Valley East and Ox Valley West alternative variations are approximately 16 and 17 miles in length, respectively, and potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution.

After considering design features and mitigation measures, impacts to raptors and other migratory birds from Project construction and operation would be limited primarily to habitat loss and fragmentation. The Pinto Alternative Variation is approximately 29 miles in length, of which approximately 21 miles are located within the Dixie National Forest. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution. Impacts to Dixie National Forest MIS not otherwise classified as special status species are listed in **Table 3.7-38**. Impacts to MIS also classified as special status are discussed in Section 3.8, Special Status Wildlife Species. After considering design features and mitigation measures, impacts to raptors and other migratory birds from construction and operation of the Pinto Alternative Variation would be limited primarily to habitat loss, fragmentation, disturbance from routine maintenance activities, and disturbance during routine maintenance activities.

Alternative Connectors in Region III

The Moapa and the Avon alternative connectors would include minimal increases of total habitat disturbance relative to the total impacts associated with Region III alternatives, if they were to be utilized. **Table 3.7-40** summarizes impacts associated with the alternative connectors in Region III.

Table 3.7-39 Summary of Region III Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Ox Valley East Alternative Variation			Comparable Portion of Alternative III-A			Ox Valley West Alternative Variation			Comparable Portion of Alternative III-A			Pinto Alternative Variation			Comparable Portion of Alternative III-A		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species																		
Utah mule deer crucial winter range	0	0	0	27	6	804	0	0	0	27	6	804	57	14	3,936	73	17	3,734
Percentage of existing habitat within the Region III big game analysis area	0	0	0	<0.01	<0.01	0.10	0	0	0	<0.01	<0.01	0.10	<0.01	<0.01	0.48	<0.01	<0.01	0.46
Small Game and Nongame Species																		
Small game and nongame potential habitat (acres)[1]	584	99	17,210	528	94	19,692	595	99	12,774	528	94	19,692	993	109	35,239	827	122	29,013
Percentage of potential habitat within the Region III wildlife analysis area	<0.01	<0.01	0.24	<0.01	<0.01	0.28	<0.01	<0.01	0.18	<0.01	<0.01	0.28	0.01	<0.01	0.49	0.01	<0.01	0.41
Waterfowl																		
Waterfowl potential habitat[2]	9	3	551	6	1	285	9	3	537	6	1	285	6	1	585	6	1	322
Percentage of potential habitat within the Region III wildlife analysis area	<0.01	<0.01	0.26	<0.01	<0.01	0.13	<0.01	<0.01	0.25	<0.01	<0.01	0.13	<0.01	<0.01	0.27	<0.01	<0.01	0.15
Relative Collision Potential for Migratory Birds																		
Length of transmission line (miles)[3]	16			15			17			15			29			24		
Raptor Nests (Non-special Status)																		
Number of raptor nests within 1 mile of the reference line[4]	1			17			1			17			7			64		
Bird Habitat Conservation Areas																		
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	29			153			29			153			302			122		
Percentage of existing BHCA habitat within the Region III wildlife analysis area	<0.01			0.02			<0.01			0.02			0.04			0.02		
Audubon Important Bird Areas																		
IBA (acres) within 2-mile transmission line corridor	0			0			0			0			0			0		
IBA (acres) within the Region III wildlife analysis area	0			0			0			0			0			0		

Table 3.7-39 Summary of Region III Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Ox Valley East Alternative Variation			Comparable Portion of Alternative III-A			Ox Valley West Alternative Variation			Comparable Portion of Alternative III-A			Pinto Alternative Variation			Comparable Portion of Alternative III-A		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Dixie National Forest MIS Not Otherwise Classified as Special Status Species[5]																		
Wild turkey potential Habitat categories: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	299	50	0	242	43	8,943	292	47	5,815	242	43	9,223	495	56	19,532	252	46	11,689
Percentage of potential habitat within the Region III MIS Analysis Area	0.02	<0.01	0	0.02	<0.01	0.69	0.02	<0.01	0.45	0.02	<0.01	0.71	0.04	<0.01	1.52	0.02	<0.01	0.90
Northern flicker Habitat categories: 1, 2, 5, 6, 12, 16, 21	297	49	0	238	43	8,783	290	46	5,663	238	43	9,032	491	56	19,401	249	46	11,617
Percentage of potential habitat within the Region III MIS Analysis Area	0.02	<0.01	0	0.02	<0.01	0.69	0.02	<0.01	0.44	0.02	<0.01	0.71	0.04	<0.01	1.52	0.02	<0.01	0.91

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of disturbance to potential waterfowl habitat include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Length refers to length of 600-kV transmission line and serves as a metric for avian collision potential.

[4] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of two raptor nests for which the species is not known are documented in the comparable portion of the Pinto Alternative Variation. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8, Special Status Wildlife Species.

[5] Potential construction impacts to northern goshawk habitat are less than five acres from the Ox Valley East and West Variations; potential construction impacts from the Pinto Variation are less than 1 acre.

Table 3.7-40 Summary of Region III Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Moapa Alternative Connector	• Approximately 13 miles in length.[1] • Approximately 9 acres of construction, 2 acres of operation, and 358 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 429 acres of construction, 34 acres of operation, and 13,407 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 136 acres of construction and 10 acres of operation and 2,972 acres of indirect impacts to waterfowl potential habitat would occur. • The Lower Muddy River BHCA is crossed by the 250 foot-wide transmission line ROW for a total of 30 acres. • No raptor nests are within 1 mile of the reference line.
Avon Alternative Connector	• Approximately 8 miles in length.[1] • Approximately 104 acres of construction, 21 acres of operation, and 8,614 acres of indirect impacts to pronghorn crucial yearlong range would occur. • Approximately 264 acres of construction and 21 acres of operation and 8,316 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 108 acres of indirect impacts to waterfowl potential habitat would occur. • Five raptor nests are within 1 mile of the reference line.

[1]Length refers to length of transmission lines, and serves as a proxy metric for avian collision potential.

Table 3.7-41 provides a comparison of alternative electrode bed locations proposed in Region III. Some locations might serve multiple alternative routes, while others could only be associated with a particular alternative route.

Table 3.7-41 Summary of Region III Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa - Carp Elgin Rd (Alternative III-A)	• Approximately 6 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 91 acres of construction, 19 acres of operation, and 13,594 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 35 acres of construction, 7 acres of operation, and 3,746 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 999 acres of indirect impacts to the Virgin River BHCA would occur. • Approximately 764 acres of indirect impacts to the Virgin River IBA would occur.
Mormon Mesa - Carp Elgin Rd (Alternative III-B)	• Approximately 8 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 103 acres of construction, 26 acres of operation, and 13,594 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 39 acres of construction, 10 acres of operation, and 3,746 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 999 acres of indirect impacts to the Virgin River BHCA would occur. • Approximately 764 acres of indirect impacts to the Virgin River IBA would occur.

Table 3.7-41 Summary of Region III Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Halfway Wash - Virgin River (Alternative III-A)	• Approximately 4 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 84 acres of construction, 16 acres of operation, and 13,349 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 18 acres of construction, 3 acres of operation, and 2,347 acres of indirect impacts to waterfowl potential habitat would occur.
Halfway Wash – Virgin River (Alternative III-B)	• Approximately 6 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 93 acres of construction, 20 acres of operation, and 13,349 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 20 acres of construction, 4 acres of operation, and 2,347 acres of indirect impacts to waterfowl potential habitat would occur.
Halfway Wash East (Alternative III-A)	• Approximately 8 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 104 acres of construction, 26 acres of operation, and 13,278 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 28 acres of construction, 7 acres of operation, and 3,378 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 216 acres of indirect impacts of the Virgin River BHCA would occur.
Halfway Wash East (Alternative III-B)	• Approximately 8 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 102 acres of construction, 25 acres of operation, and 13,278 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 28 acres of construction, 7 acres of operation, and 3,378 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 216 acres of indirect impacts of the Virgin River BHCA would occur.
Meadow Valley 2 (Alternative III-C)	• Approximately 22 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 174 acres of construction, 66 acres of operation, 13,594 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 16 acres of construction, 6 acres of operation, and 797 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 1,075 acres of indirect impacts to the Lower Muddy River BHCA would occur.
Delta Ground Electrode Siting Area	• Approximately 19 miles in length.[1] • Approximately 131 acres of construction, 40 acres of operation, and 12,978 acres of indirect impacts to pronghorn crucial yearlong range would occur. • Approximately 1 acre of construction, 0.5 acres of operation, and 310 acres of indirect impacts to mule deer crucial winter range would occur. Approximately 381 acres of indirect impacts to the Vernon Unit migrating mule deer crucial winter range would occur. • Approximately 129 acres of construction, 39 acres of operation, and 13,232 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 2 acres of construction, 1 acre of operation, and 579 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 1,451 acres of indirect impacts to the Fish Springs National Wildlife Refuge BHCA would occur. • Approximately <1 acre of indirect impacts to Fish Springs National Wildlife Refuge UT16 IBA would occur.

[1] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[2] Length refers to length of transmission lines and serves as a metric for avian collision potential.

3.7.6.6 Region IV

Table 3.7-42 provides a tabulation of impacts associated with the alternative routes in Region IV. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Table 3.7-42 Summary of Region IV Alternative Route Impact Parameters for Wildlife

Parameter	Alternative IV-A (Applicant Proposed and Agency Preferred)			Alternative IV-B			Alternative IV-C		
	Construction impacts	Operation Impacts	Indirect Impacts	Construction impacts	Operation Impacts	Indirect Impacts	Construction impacts	Operation Impacts	Indirect Impacts
Big Game Species									
Nevada desert bighorn sheep occupied habitat (acres)	122	39	8,259	69	31	4,444	39	19	4,562
Percentage of potential habitat within the Region IV big game analysis area	0.05	0.01	3.21	0.03	0.01	1.72	0.02	<0.01	1.77
Small Game and Nongame Species									
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile potential habitat (acres)[1]	900	98	30,576	897	121	25,722	924	122	28,901
Percentage of potential habitat within the Region IV wildlife analysis area	0.11	0.01	3.70	0.11	0.01	3.11	0.11	0.01	3.50
Waterfowl potential habitat (acres)[2]	13	1	433	21	7	1,076	21	7	1,171
Percentage of potential habitat within the Region IV wildlife analysis area	0.02	<0.01	0.59	0.03	<0.01	1.47	0.03	<0.01	1.59
Relative Collision Potential for Migratory Birds									
Length of transmission line (miles)[4]	37			39			44		
Raptor Nests (Non-special Status)									
Number within 1 mile of the reference line[3]	0			0			0		
Bird Habitat Conservation Areas									
Acres of BHCAs crossed by the 250 foot-wide transmission line ROW	124			328			604		
Percentage of existing BHCA habitat within the Region IV wildlife analysis area	0.03			0.08			0.14		
Audubon Important Bird Areas									
IBA (acres within 2-mile transmission line corridor)	0			643			643		
Percentage of existing IBA within the Region IV wildlife analysis area	0			1.01			1.01		

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of potential waterfowl habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species.

[4] Length refers to potential length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Alternative IV-A Habitat Disturbance and Fragmentation

Alternative IV-A would cross approximately 37 miles of wildlife habitat in southern Nevada. This alternative will be entirely co-located with other existing transmission lines as shown in **Table 3.7-43**. Existing conditions within the Alternative IV-A 2-mile transmission line corridor relative to wildlife can be characterized as highly disturbed and fragmented. Alternative IV-A in southern Nevada is highly fragmented and disturbed by three major highways; Highway 147, Highway 564, and Highway 93, as well as many other city and county roads within the 2-mile transmission line corridor. Major sources of disturbance within the Alternative IV-A 2-mile transmission line corridor include a residential portion along the eastern flank of the city of Henderson, Nevada, a Las Vegas Valley Water waste water treatment plant, and a Pabco gypsum quarry located northeast of the city of Las Vegas. A total of 95 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-43**.

Table 3.7-43 Summary of Existing Conditions by Alternative within Region IV

Alternative	Length (miles)	Length of Greenfield Construction	Length of Co-Located Construction	Miles of Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
IV-A	37	0	37	95	2.57
IV-B	39	12	34	132	3.38
IV-C	44	12	33	175	3.98

Key Parameters Summary

Game Species

The types of impacts to big game species under Alternative IV-A generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Desert bighorn sheep occupied habitat would be impacted under Alternative IV-A. Alternative IV-A would result in the construction and operation disturbance of 900 acres and 98 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region IV wildlife analysis area. Alternative IV-A also would result in the construction disturbance of 13 acres and operation disturbance of 1 acre of waterfowl potential habitat. These areas represent 0.02 percent and <0.01 percent of the available waterfowl potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative IV-A generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-A would result in the construction and operation disturbance of 900 acres and 98 acres, respectively, of small mammal and reptile potential habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative IV-A would generally be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. Alternative IV-A would result in the construction and operation disturbance of 900 acres and 98 acres, respectively, of potential suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region IV wildlife analysis area. The length of Alternative IV-A is found in **Table 3.7-41**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

No non-special status raptor nests have been identified within one mile of the reference line along Alternative IV-A. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative IV-A would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative IV-A.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative IV-B

Alternative IV-B Habitat Disturbance and Fragmentation

Alternative IV-B would cross approximately 39 miles of wildlife habitat in Nevada. Approximately 34 miles (87 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-43**. Existing conditions within the Alternative IV-B 2-mile transmission line corridor relative to wildlife can be characterized as highly disturbed and fragmented. Alternative IV-B in southern Nevada is highly fragmented and disturbed by four major highways; Highway 147, Highway 564, Highway 93, and Highway 95, as well as many other city and county roads within the 2-mile transmission line corridor. Major sources of disturbance within the Alternative IV-B 2-mile transmission line corridor include the northern portion of Boulder City, Nevada, a Pabco gypsum quarry located northeast of the city of Las Vegas, and low density industrial operations to the west of Lake Las Vegas. Wildlife habitat along the Alternative IV-B is also fragmented by the existence of Lakeshore road, the River Mountain Loop Trial, and the Historic Railroad hiking trail, which parallel the 2-mile transmission line corridor immediately to the west of Lake Las Vegas. A total of 132 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-43**.

Game Species

The types of impacts to big game species under Alternative IV-B generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-B would result in the construction

and operation disturbance of 897 acres and 121 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region IV wildlife analysis area. Alternative IV-B also would result in the construction disturbance of 21 acres and operation disturbance of 7 acres of waterfowl potential habitat. These areas represent 0.03 percent and <0.01 percent of the available waterfowl potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative IV-B generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-B would result in the construction and operation disturbance of 897 and 121 acres, respectively, of small mammal and reptile potential habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative IV-B generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. Alternative IV-B would result in the construction and operation disturbance of 897 acres and 121 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region IV wildlife analysis area. The length of Alternative IV-B is found in **Table 3.7-42**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

No non-special status raptor nests have been identified within one mile of the reference line along Alternative IV-B. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, there would be negligible potential for electrocution and remaining Project construction and operation impacts to raptors and other migratory birds under Alternative IV-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative IV-B.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures

included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative IV-C

Alternative IV-C Habitat Disturbance and Fragmentation

Alternative IV-C would cross approximately 44 miles of wildlife habitat in Nevada. Approximately 33 miles (75 percent) of this alternative would be co-located with other existing transmission lines as shown in **Table 3.7-43**. Existing conditions within the Alternative IV-C 2-mile transmission line corridor relative to wildlife can be characterized as highly disturbed and fragmented. Alternative IV-C in southern Nevada is highly fragmented and disturbed by four major highways; Highway 147, Highway 564, Highway 93, and Highway 95, as well as many other city and county roads within the 2-mile transmission line corridor. Major sources of disturbance within the Alternative IV-C 2-mile transmission line corridor include a Pabco gypsum quarry located northeast of the city of Las Vegas, and low density industrial operations to the West of Lake Las Vegas. Wildlife habitat along the Alternative IV-C also is fragmented by the existence of Lakeshore road, the River Mountain Loop Trial, and the Historic Railroad hiking trail, which parallel the 2-mile transmission line corridor immediately to the West of Lake Las Vegas. A total of 175 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-43**.

Game Species

The types of impacts to big game species under Alternative IV-C generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-C would result in the construction and operation disturbance of 924 acres and 122 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region IV wildlife analysis area. Alternative IV-C also would result in the construction disturbance of 21 acres and operation disturbance of 7 acres of waterfowl potential habitat. These areas represent 0.03 percent and <0.01 percent of the available waterfowl potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative IV-C generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-C would result in the construction and operation disturbance of 924 acres and 122 acres, respectively, of small mammal and reptile potential habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative IV-C generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. Alternative IV-C would result in the construction and operation disturbance of 924 acres and 122 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird

breeding, roosting, and foraging habitat within the Region IV wildlife analysis area. The length of Alternative IV-C is found in **Table 3.7-42**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

No non-special status raptor nests have been identified within one mile of the reference line along Alternative IV-C. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative IV-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative IV-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Region IV Conclusion

Based on a comparison of impact parameters for Region IV alternatives, potential construction and operation impacts to wildlife would be greatest for Alternative IV-C as shown in **Table 3.7-42**. Potential effects for Alternative IV-B would be similar to those of Alternative IV-C although less overall acreage would be impacted (**Table 3.7-42**). Potential effects for Alternative IV-A would be relatively low compared to those of Alternatives IV-B and IV-C. Alternative IV-C would result in the greatest combined direct and indirect impacts to big game habitat, small game habitat, and migratory bird habitat in comparison to the other Region IV alternatives (**Table 3.7-42**). Alternative IV-C also could result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-19**. Even though the greatest level of impacts are associated with Alternative IV-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.6 and **Appendix C**).

Alternative Variations in Region IV

The types of impacts to big game species under the Marketplace Alternative Variation in Region IV generally would be the same as the comparable portions of Alternatives IV-B, but would differ in the amount of potential habitat disturbed (**Table 3.7-44**). Similar to the comparable portions of Alternatives IV-B, after considering design features and mitigation measures, impacts to game and nongame species from Project construction and operation would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-44 Summary of Region IV Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Marketplace Alternative Variation			Comparable Portion of Alternative IV-B		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species						
Nevada desert bighorn sheep occupied habitat (acres)	21	4	2,230	0	0	0
Percentage of existing habitat within the Region IV big game analysis area	<0.01	<0.01	0.87	0	0	0
Small Game and Nongame Species						
Small game and nongame potential habitat (acres)[1]	117	10	3,121	1	<1	51
Percentage of potential habitat within the Region IV wildlife analysis area	0.01	<0.01	0.38	<0.01	<0.01	0.01
Waterfowl potential habitat[2]	0	0	0	0	0	0
Percentage of potential habitat within the Region IV wildlife analysis area	0	0	0	0	0	0
Relative Collision Potential for Migratory Birds						
Length of transmission line (miles)[3]	8			7		
Raptor Nests (Non-special Status)						
Number of raptor nests within 1 mile of the reference line	0			0		
Bird Habitat Conservation Areas						
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	0			0		
Percentage of existing habitat within the Region IV wildlife analysis area	0			0		
Audubon Important Bird Areas						
IBA (acres) within 2-mile transmission line corridor	0			0		
IBA (acres) within the Region IV wildlife analysis area	0			0		

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, conifer forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, riparian, pinyon-juniper, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of waterfowl potential habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

The Marketplace Alternative Variation is 8 miles in length and potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution. After considering design features and proposed mitigation measures, impacts to raptors and other migratory birds from construction and operation of the Marketplace Alternative Variation would be limited primarily to habitat loss, fragmentation, mortality from collisions, negligible potential for electrocution, and disturbance during routine maintenance activities.

Table 3.7-44 provides a tabulation of impacts associated with the Marketplace Alternative Variation in Region IV.

Alternative Connectors in Region IV

The five alternative connectors would include minimal increases of total habitat disturbance relative to the total impacts associated with Region IV alternatives if they were to be utilized. These alternative connectors would cross occupied desert bighorn sheep habitat. **Table 3.7-45** summarizes impacts associated with the alternative connectors in Region IV.

Table 3.7-45 Summary of Region IV Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Sunrise Mountain Alternative Connector	• Approximately 3 miles in length.[1] • Approximately 87 acres of construction; 8 acres of operation; and 2,208 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 34 acres of indirect impacts would occur to waterfowl potential habitat. • No raptor nests are within 1 mile of the reference line.
Lake Las Vegas Alternative Connector	• Approximately 4 miles in length.[1] • Approximately 24 acres of construction; 9 acres of operation; and 779 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 115 acres of construction, 15 acres of operation, and 1,305 acres of indirect impacts to small game and nongame potential habitat would occur. • 118 acres of BHCAs are within the 250 foot-wide transmission line ROW. • No raptor nests are within 1 mile of the reference line.
Three Kids Mine Alternative Connector	• Approximately 5 miles in length.[1] • Approximately 69 acres of construction, 26 acres of operation, and 1,507 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 166 acres of construction, 29 acres of operation, and 1,657 acres of indirect impacts to small game and nongame potential habitat would occur. • 118 acres of BHCAs are within the 250-foot-wide transmission line ROW. • No raptor nests are within 1 mile of the reference line.
River Mountains Alternative Connector	• Approximately 7 miles in length.[1] • Approximately 136 acres of construction, 56 acres of operation, and 5,904 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 270 acres of construction, 54 acres of operation, and 5,537 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 1 acre of construction, 0.1 acres of operation, and 11 acres of indirect impacts to waterfowl potential habitat would occur. • No raptor nests are within 1 mile of the reference line.
Railroad Pass Alternative Connector (Alts IV-A & IV-B)	• Approximately 3 miles in length.[1] • Approximately 20 acres of construction, 4 acres of operation, and 679 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 10 acres of construction, 3 acres of operation, and 830 acres of indirect impacts to small game and nongame potential habitat would occur. • No raptor nests are within 1 mile of the reference line.

[1]Length refers to length of transmission lines, and serves as a proxy metric for avian collision potential.

3.7.6.7 Residual Impacts

Although it is anticipated that wildlife mitigation measures would be successfully implemented, some residual impacts to wildlife would occur. Wildlife injuries and mortalities are expected to occur as a result of collisions with transmission towers, guy wires, transmission lines, and wildlife potential vehicles. Quantification of these impacts is not presented in this analysis due to the lack of available data and the variability of wildlife populations.

It is anticipated that reclamation efforts would be successful and no residual impacts to habitats will occur. Timeframes for successful reclamation can vary by habitat type and initial impact intensity. During extended periods of reclamation, it is expected that habitat function may be reduced until reclamation is complete.

3.7.6.8 Impacts to Wildlife from the No Action Alternative

Under the No Action Alternative, the BLM would not issue a ROW grant or temporary use permit, the USFS would not issue a special use permit for the ROW on lands administered by the USFS, and the proposed Project would not be implemented. The analysis areas would continue to be subject to current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). The previously described impacts to wildlife associated with the development of the proposed Project would not occur.

3.7.6.9 Irreversible and Irretrievable Commitment of Resources

Construction and operation of any of the project alternatives would result in the irretrievable commitment of both wildlife and potential habitats during the life of the Project. Depending on the selection of alternatives, the amount of wildlife habitat irretrievably committed would range from 23,984 acres to 29,539 acres. However, as discussed **Appendix D**, it is anticipated that upon decommissioning of the Project reclamation measures would result in the return of impacted areas to native habitats. Some vegetation communities are expected to return to a native state within in a relatively short period of time (i.e., 5 years). Other more sensitive habitats, such as sagebrush shrublands, may require up to 50 years or longer to return to native conditions. Regardless of timeframes, it is possible that wildlife habitat lost during construction could return to pre-project conditions, thus avoiding any irreversible commitments of wildlife habitat.

3.7.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

Wildlife habitat would be diminished due to local short-term and long-term uses until reclaimed areas return to mature vegetation communities. As discussed above, these temporal losses can vary in the time required to return to pre-construction conditions. This range of temporal loss is expected to be between 5 and 50 years, depending on the vegetation community. Construction and operation of any of the Project alternatives is anticipated to result in minor impacts to the short-term productivity of local migratory bird populations and sagebrush obligate wildlife species due to the loss of habitat resulting from construction and the avoidance of suitable habitats resulting from increased temporary disturbance levels. These impacts are expected to be limited to mortality resulting from collisions with Project infrastructure and avoidance due to increased levels of human activity and predation. Impacts from direct habitat loss are expected to be negligible as the total anticipated loss of wildlife habitat as a result of Project construction will be less than 1 percent of available potential habitats within the wildlife analysis area.

3.8 Special Status Wildlife Species

3.8.1 Regulatory Background

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the BLM and USFS. In addition, there are state-protected and sensitive wildlife lists for Colorado, Utah, and Nevada (Colorado Revised Statutes 33-2-105, Utah Rules R657-3, R657-19, R657-48, and Nevada Administrative Code 501.100-503.104) that include many of the BLM and USFS sensitive species as well as ESA-listed species.

In accordance with the ESA, the lead agencies (BLM and Western) and USFS, in coordination with the USFWS, must ensure that any action that they authorize, fund, or carry out is not likely to jeopardize a federally listed species or result in the destruction or adverse modification of critical habitat. In addition, as stated in the BLM's Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it is BLM policy "to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA provisions are no longer needed for these species, and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA." The USFS Manual (FSM) 2670 states "Sensitive species of native plant and animal species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing".

Regulations that directly influence special status wildlife species management decisions within the special status species wildlife analysis area are primarily implemented by the BLM, USFS, and state wildlife agencies, which consist of the WGFD, CPW (formerly CDOW), UDWR, and NDOW. Specific special status species statutes, regulations, and policies relevant to the proposed project are presented in **Table 3.8-1**.

Table 3.8-1 Statutes, Regulations, and Policies Relevant to Special Status Species

Topic	Statutes, Regulations, and Policies
Wildlife (mammals, birds, reptiles, terrestrial invertebrates)	• Endangered Species Act (ESA) of 1973; • Migratory Bird Treaty Act (16 USC 703 et seq.); • BLM Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125); • U.S. Forest Service Manual (FSM) 2670; • Colorado Revised Statutes 33-2-105; • Utah Rules R657-3, R657-19, and R657-48; • Nevada Administrative Code 501.100-503.104; • Bald and Golden Eagle Protection Act (16 USC, § 668 et seq.); • BLM Instruction Memorandums (IM) 2010-012, 2010-156, 2012-043, and 2012-044; and • State of Wyoming Executive Order 2011-5.

The USFS further defines MIS for each national forest. A MIS is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that their status and trends provide insight to the integrity of the larger ecological system to which they belong. Wildlife species that have been selected as MIS for the National Forests crossed by the project are presented in **Table 3.8-2**. Seven MIS also are categorized as special status species and are addressed in this section. The remainder is presented in Section 3.7, Wildlife. Mule deer and Rocky Mountain elk are analyzed as big game species in Section 3.7, Wildlife.

Table 3.8-2 USFS Management Indicator Species for National Forests Crossed by the Project

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-La Sal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Mammals						
Abert's squirrel Habitat Association: 6	*Sciurus aberti*				MIS, but does not occur in analysis area of this national forest	
American beaver Habitat Association: 15,21	*Castor Canadensis*					MIS
Mule deer Refer to Section 3.7.4.1	*Odocoileus hemionus*	MIS	MIS	MIS	MIS, Big Game	
Elk Refer to Section 3.7.4.1	*Cervus Canadensis*	MIS	MIS	MIS	MIS, Big Game	
Birds						
Northern goshawk Habitat Association: 2, 5, 6	*Accipiter gentilis*	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I
Golden eagle Habitat Association: 1, 4, 7, 10, 13, 14, 16, 18, 19, 20	*Aquila chrysaetos*	MIS, BLM			MIS, BLM	
Greater sage-grouse Habitat Association: 18	*Centrocercus urophasianus*	MIS, FC, BLM, USFS, UT-SS Tier I				
White-tailed ptarmigan Habitat Association: 20	*Lagopus leucura*	MIS				
Wild turkey Habitat Association: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	*Meleagris gallopavo*		MIS			
Red-naped sapsucker Habitat Association: 2, 5, 6, 21	*Sphyrapicus nuchalis*	MIS, BLM				
Hairy woodpecker Habitat Association: 1, 2, 6, 16, 21	*Picoides villosus*			MIS		
American three-toed woodpecker Habitat Association: 5	*Picoides dorsalis*					MIS, BLM, USFS, UT-SS Tier II
Northern flicker Habitat Association: 1, 2, 5, 6, 12, 16, 21	*Colaptes auratus*		MIS			
Warbling vireo Habitat Association: 2, 16, 21	*Vireo gilvus*	MIS				
Western bluebird Habitat Association: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia Mexicana*			MIS		
Mountain bluebird Habitat Association: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia currucoides*			MIS		
Sage thrasher Habitat Association: 18	*Oreoscoptes montanus*			MIS, BLM		

Table 3.8-2 USFS Management Indicator Species for National Forests Crossed by the Project

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-La Sal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Yellow warbler Habitat Association: 2, 16, 19, 21	*Dendroica petechia*			MIS		
MacGillivray's warbler Habitat Association: 2, 16, 19, 21	*Oporornis tolmiei*			MIS		
Brewer's sparrow Habitat Association: 18	*Spizella breweri*			MIS		
Vesper sparrow Habitat Association: 1, 10, 13, 18	*Pooecetes gramineus*			MIS, BLM		
Song sparrow Habitat Association: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	*Melospiza melodia*	MIS		MIS		
Lincoln's sparrow Habitat Association: 2, 12, 16, 19, 21	*Melospiza lincolnii*			MIS		

[1] Habitat association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Note: Status is defined as: BLM = BLM Sensitive, USFS = USFS Sensitive, UT-SS = Utah Sensitive Species (Tier I and Tier II species are defined in Utah's Comprehensive Wildlife Strategy), NV-P = Nevada State Protected.

3.8.2 Data Sources

Information regarding special status wildlife species and their habitat within the special status species analysis area was obtained from a review of existing published sources, BLM RMPs, USFS forest management plans, BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information resulting from correspondence with agency wildlife biologists was incorporated into this section, as appropriate. Species-specific surveys will be conducted, as appropriate, after the agency preferred alternative has been finalized and preliminary engineering is complete.

3.8.3 Analysis Areas

The special status wildlife species analysis areas are presented in **Table 3.8-3**.

Table 3.8-3 Analysis Areas for Special Status Wildlife Species

Species	Region	Analysis Area
Federally listed and Candidate Species		
Desert tortoise	III and IV	USGS model rankings 0.7 – 1.0.
California condor	III	HUC10 watersheds traversed by the route alternatives in Region III.
Greater sage-grouse	I, II, III	• Core Areas in Wyoming. • Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) in Colorado. • Occupied, brood-rearing, and wintering habitat in Utah.

Table 3.8-3 Analysis Areas for Special Status Wildlife Species

Species	Region	Analysis Area
• Whooping crane • Piping plover • Interior least tern	I	Potentially suitable wetlands and waterbodies within the Platte River watershed.
Yuma clapper rail	III, IV	Herbaceous wetland areas within 0.5 mile of the 2-mile transmission line corridor along the Muddy River in Nevada.
Western yellow-billed cuckoo	I, II, III, IV	Compare Natural Heritage data within a 0.5 mile buffer of perennial waterbodies with developed riparian vegetation within the HUC10 watersheds traversed by the route alternatives.
Mexican spotted owl	II, III	Modeled habitat in the Vernal Field Office.
Southwestern willow flycatcher	III, IV	The following Management Units within the Lower Colorado Recovery Unit: Pahranagat, Virgin, western portion of the Middle Colorado, Hooter-Parker, and southern portion of the Amargosa. Also included is the area within 0.5 mile of the riparian corridor, which is crossed by the Project at Newcastle Reservoir and Pinto Creek.
Black-footed ferret	I, II	Non-essential Experimental Population Areas in Utah and Colorado, Continental Divide (2), Dad, and Desolation Flats non-block cleared areas in Wyoming.
Canada lynx	I, II	Forested habitats in the HUC10 watersheds traversed by the route alternatives in Region II.
Utah prairie dog	II, III	West Desert Recovery Unit, Paunsaugunt Recovery Unit, Awapa Plateau Recovery Unit.
Gray wolf	I, II	HUC10 watersheds traversed by the route alternatives in Regions I and II.
BLM, USFS Sensitive, and State-Protected Species		
Mammals		
Bats	All	HUC10 watersheds traversed by the route alternatives.
• Dark kangaroo mouse • Desert Valley kangaroo mouse • Idaho pocket gopher • White-tailed prairie dog	All	HUC10 watersheds traversed by the route alternatives.
Pygmy rabbit	I, II, III	Sagebrush within HUC10 watersheds traversed by the route alternatives in Regions I, II, and III.
Fisher	II	Uintah/Wasatch/Cache National Forest, conifer forest habitat within HUC10 watersheds traversed by the route alternatives.
• Kit fox • Swift fox	All	Suitable habitat within species' respective ranges in HUC10 watersheds traversed by the route alternatives.
Wolverine	I, II	• Ashley National Forest. • Tundra and conifer forest in CO within HUC10 watersheds traversed by the route alternatives.
River otter	I, II	Open water and woody riparian vegetation communities in HUC10 watersheds traversed by the route alternatives in Regions I and II.
Desert bighorn sheep	II, III, IV	• Big Game Management Units in Colorado, Utah, and Nevada. • Dixie, Fishlake and Manti-La Sal national forests.
Rocky Mountain bighorn sheep	I, II, III	• Big Game Management Units in Wyoming, Colorado, and Utah. • Ashley and Uintah/Wasatch/Cache national forests.

Table 3.8-3 Analysis Areas for Special Status Wildlife Species

Species	Region	Analysis Area
Raptors and Other Migratory Birds		
Birds except federally listed and candidate species[1]	All	• HUC10 watersheds traversed by the route alternatives. • Ashley, Dixie, Fishlake, Manti-La Sal, and Uintah/Wasatch/Cache national forests.
Reptiles		
Reptiles	All	HUC10 watersheds traversed by the route alternatives.
Terrestrial Invertebrates		
Terrestrial invertebrates	All	HUC10 watersheds traversed by the route alternatives.
USFS MIS Species (Those not addressed in Section 3.7)		
Northern goshawk	II and III	Suitable habitat within the Ashley, Dixie, Fishlake, Manti-La Sal, and Uintah/Wasatch/Cache national forests.
Golden eagle	II and III	• HUC10 watersheds traversed by the route alternatives. • Suitable habitat within the Ashley and Manti-La Sal national forests.
Red-naped sapsucker	II	Suitable habitat within the Ashley National Forest.
• Sage thrasher • Vesper sparrow	II	Suitable habitat within the Fishlake National Forest.
American three-toed woodpecker	II	Suitable habitat within the Uintah/Wasatch/Cache National Forest.

[1] The greater sage-grouse also is classified as an MIS for the Ashley National Forest, but the greater sage-grouse analysis area is defined more specifically as a candidate species.

The special status wildlife analysis area is defined as suitable habitat within the HUC 10 watershed areas crossed by the Project. This area is referred to as the special status wildlife analysis area. The HUC 10 watershed areas provide a clear delineation of vegetation communities supporting wildlife habitat that are separated by distinct geographical features, such as elevation and topography. Other special status species with more limited ranges and/or specifically defined habitat preferences are accorded more detailed analysis areas (**Table 3.8-3**). Section 3.4, Water Resources, presents tables and figures of HUC 10 watersheds in the wildlife analysis area.

The MIS Analysis Area for USFS MIS includes suitable habitat within the entire national forest(s) for which they are identified. This MIS Analysis Area was chosen because it allows disclosure of the context of impacts within the unique requirements of the USFS for monitoring and managing MIS species within the jurisdiction of NFS lands. The exceptions are mule deer and Rocky Mountain elk, which are analyzed under the big game analysis areas described in Section 3.7, Wildlife.

Special status wildlife analysis areas were chosen because they represent the combination of geographic areas containing habitats that would be impacted by the proposed Project, as well as management considerations to which these habitats are subject. Accordingly, these analysis areas provide a clear disclosure of the context of Project impacts in light of the management considerations for these areas.

Table 3.8-4 presents the acreages of the major vegetation communities present within the special status wildlife analysis area. These acreages also are presented in **Table 3.7-2**.

Table 3.8-4 Vegetation Communities Within the Special Status Wildlife Analysis Area

Vegetation Community	Acres Within the Special Status Wildlife Analysis Area[1]	Percent of the Special Status Wildlife Analysis Area
1. Agricultural Land	784,433	3.1
2. Aspen Forest and Woodland	641,483	2.6
3. Barren/Sparsely Vegetated	321,697	1.3
4. Cliff and Canyon	816,392	3.3
5. Conifer Forest	539,604	2.2
6. Deciduous Forest	13,933	0.1
7. Desert Shrubland	3,074,124	12.3
8. Developed/Disturbed Land[2]	988,126	4.0
9. Dunes	133,157	0.5
10. Grassland	1,537,916	6.2
11. Greasewood Flat	875,991	3.5
12. Herbaceous Wetland	188,239	0.8
13. Montane Grassland	70,313	0.3
14. Montane Shrubland	875,292	3.5
15. Open Water	154,328	0.6
16. Pinyon-juniper	4,081,539	16.4
17. Riparian	68,489	0.3
18. Sagebrush Shrubland	6,539,728	26.2
19. Saltbush Shrubland	2,991,796	12.0
20. Tundra	13,956	0.1
21. Woody Riparian and Wetlands	214,144	0.9
Total	24,924,680	100.0

[1] The special status wildlife analysis area includes suitable habitat within the HUC10 watershed areas crossed by the Project.

[2] The developed/disturbed vegetation community is not considered to be typical wildlife habitat and is not included in analyses.

Sources: USGS 2010, 2005, 2004 (SWReGAP and NWReGAP).

Table 3.8-5 presents the acreages of the major vegetation communities present within each national forest crossed by the Project. These acreages also are presented in **Table 3.7-3**.

3.8.4 Baseline Description

A total of 129 special status wildlife species were identified as potentially occurring within the special status wildlife analysis area. These species, their associated habitats, and their potential for occurrence in the special status wildlife analysis area are summarized in **Appendix G**, **Table G-2**. Occurrence potential within the special status wildlife analysis area was evaluated for each species based on its habitat requirements and known distribution. Based on these parameters, nine special status wildlife species (Aegialian scarab beetle, Gunnison sage-grouse, Baird's sparrow, Preble's meadow jumping mouse, Preble's shrew, silky pocket mouse, Mexican vole, Gunnison's prairie dog, and black-tailed prairie dog) have been eliminated from detailed analysis, as discussed in **Appendix G**, **Table G-2**. The basis for elimination of a species is that the special status wildlife analysis area does not include the geographic

Table 3.8-5 Vegetation Communities Within National Forests Crossed by the Project

Vegetation Community	Ashley National Forest Region II		Dixie National Forest Region III		Fishlake National Forest Region II		Manti-La Sal National Forest Region II		Uinta-Wasatch-Cache National Forest Region II	
	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest
Agriculture	2,691	0.2	629	<0.1	623	<0.1	1,466	0.1	290	<0.1
Aspen Forest and Woodland	102,261	7.7	196,825	10.5	196,958	13.5	234,483	17.5	231,663	25.9
Barren/Sparsely Vegetated	136,429	10.2	26,266	1.4	11,977	0.8	16,519	1.2	11,182	1.2
Cliff and Canyon	39,266	2.9	93,023	4.9	38,891	2.7	43,352	3.2	25,335	2.8
Conifer Forest	543,194	40.7	537,641	28.5	224,021	15.4	289,618	21.7	114,549	12.8
Deciduous Forest	1,125	0.1	0	0.0	1	<0.1	0	0.0	28,171	3.1
Desert Shrubland	0	0.0	5,265	0.3	121	<0.1	1	<0.1	0	0.0
Developed/Disturbed[1]	42,056	3.1	26,479	1.4	28,664	2.0	4,505	0.3	497	0.1
Dunes	23	<0.1	2	<0.1	0	0.0	0	0.0	0	0.0
Grassland	1,591	0.1	2,010	0.1	7,453	0.5	104	<0.1	3,211	0.4
Greasewood Flat	1,891	0.1	19	<0.1	306	<0.1	80	<0.1	0	0.0
Herbaceous Wetland	28,424	2.1	4,438	0.2	4,530	0.3	2,789	0.2	15,225	1.7
Montane Grassland	25,557	1.9	12,854	0.7	9,129	0.6	26,225	2.0	26,455	3.0
Montane Shrubland	36,831	2.8	106,207	5.6	211,109	14.5	230,868	17.3	168,362	18.8
Open Water	21,383	1.6	2,445	0.1	4,334	0.3	2,282	0.2	16,673	1.9
Pinyon-Juniper	104,031	7.8	521,470	27.7	426,154	29.3	265,022	19.8	50,613	5.7
Riparian	119	<0.1	0	0.0	0	0.0	0	0.0	0	0.0
Sagebrush Shrubland	200,159	15.0	315,223	16.7	270,972	18.6	192,203	14.4	187,523	20.9
Saltbush Shrubland	15,422	1.2	497	<0.1	2,738	0.2	2,814	0.2	71	<0.1
Tundra	17,639	1.3	16,504	0.9	7,664	0.5	18,793	1.4	57	<0.1
Woody Riparian and Wetlands	15,120	1.1	15,660	0.8	8,234	0.6	6,028	0.5	15,377	1.7
Totals	**1,335,210**	**100**	**1,883,453**	**100**	**1,453,879**	**100**	**1,337,152**	**100**	**895,255**	**100**

[1] Developed/disturbed land is not considered to be typical wildlife habitat and is not included in analyses.

range of the species. In addition, the whooping crane, interior least tern, and piping plover do not occur in the special status wildlife analysis area, but are included because of the water depletion evaluation requirement in the Platte River Basin. Special status wildlife species carried forward in this EIS include 38 mammals, 51 birds, 19 reptiles, and 12 terrestrial invertebrates, for a total of 120 species (**Table 3.8-6**).

Table 3.8-6 Species Potentially Occurring in the Special Status Wildlife Analysis Area

Common Name	Scientific Name	Status[1]
Mammals		
Allen's big-eared bat	*Idionycteris phyllotis*	BLM; NV-P; UT-SS - Tier II
Big brown bat	*Eptesicus fuscus*	BLM
Big free-tailed bat	*Nyctinomops macrotis*	BLM; UT-SS - Tier II
Brazilian free-tailed bat	*Tadarida braziliensis*	BLM
California leaf-nosed bat	*Macrotus californicus*	NV-P
California myotis	*Myotis californicus*	BLM
Cave myotis	*Myotis velifer*	BLM
Fringed myotis	*Myotis thysanodes*	BLM; UT-SS; NV-P
Greater western mastiff bat	*Eumops perotis*	BLM; NV-P
Hoary bat	*Lasiurus cinereus*	BLM
Long-eared myotis	*Myotis evotis*	BLM
Long-legged myotis	*Myotis volans*	BLM
Pallid bat	*Antrozous pallidus*	BLM
Silver-haired bat	*Lasionycteris noctivagans*	BLM
Spotted bat	*Euderma maculatum*	BLM; USFS; UT-SS - Tier II; NV-P
Townsend's (Western) big-eared bat	*Corynorhinus townsendii*	BLM; USFS; UT-SS - Tier II; NV-P
Western pipistrelle	*Pipistrellus hesperus*	BLM
Western red bat	*Lasiurus blossevillii*	BLM; UT-SS - Tier II; NV-P
Western small-footed myotis	*Myotis ciliolabrum*	BLM
Yuma myotis	*Myotis yumanensis*	BLM
Black-footed ferret	*Mustela nigripes*	EXP/NE; BLM; UT-SS; CO-SE
Canada lynx	*Lynx canadensis*	FT; BLM; UT-SS - Tier I; CO-SE
Fisher	*Martes pennanti*	USFS
Gray wolf	*Canis lupus*	FE in CO and portions of UT; BLM; UT-SS - Tier I
Kit fox	*Vulpes macrotis*	BLM; UT-SS - Tier II; CO-SE
River otter	*Lontra canadensis*	BLM; CO-ST
Swift fox	*Vulpes velox*	BLM
Wolverine	*Gulo gulo*	FC; USFS; CO-SE
Desert bighorn sheep	*Ovis canadensis nelsoni*	BLM; USFS
Rocky Mountain bighorn sheep	*Ovis canadensis*	BLM; USFS
Dark kangaroo mouse	*Microdipodops megacephalus*	BLM; UT-SS - Tier II
Pale kangaroo mouse	*Microdipodops pallidus*	BLM
Desert Valley kangaroo mouse	*Microdipodops megacephalus albiventer*	BLM; NV-P
Idaho pocket gopher	*Thomomys idahoensis*	BLM
Utah prairie dog	*Cynomys parvidens*	FT; BLM; UT-SS - Tier I
White-tailed prairie dog	*Cynomys leucurus*	BLM; UT-SS - Tier II
Wyoming pocket gopher	*Thomomys clusius*	BLM
Pygmy rabbit	*Brachylagus idahoensis*	BLM; USFS; UT-SS - Tier II
Birds		
American white pelican	*Pelecanus erythrorhynchos*	BLM, UT-SS – Tier I
Least bittern	*Ixobrychus exilis*	BLM; NV-P
White-faced ibis	*Plegadis chihi*	BLM
California condor	*Gymnogyps californianus*	FE; EXP/NE-UT; BLM; UT-SS - Tier I

Table 3.8-6 Species Potentially Occurring in the Special Status Wildlife Analysis Area

Common Name	Scientific Name	Status[1]
Trumpeter swan	*Cygnus buccinator*	BLM
Barrow's goldeneye	*Bucephala islandica*	BLM
Bald eagle	*Haliaeetus leucocephalus*	BLM; USFS; CO-ST; NV-P; UT-SS - Tier I
Northern goshawk	*Accipiter gentilis*	BLM; USFS; MIS; NV-P; UT-SS - Tier I
Swainson's hawk	*Buteo swainsoni*	BLM
Ferruginous hawk	*Buteo regalis*	BLM; NV-P; UT-SS - Tier II
Golden eagle	*Aquila chrysaetos*	BLM, MIS
Peregrine falcon	*Falco peregrinus*	BLM; USFS; NV-P
Prairie falcon	*Falco mexicanus*	BLM
Greater sage-grouse	*Centrocercus urophasianus*	FC; BLM; USFS, MIS; UT-SS - Tier II
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	BLM; UT-SS - Tier II
Yuma clapper rail	*Rallus longirostris yumanensis*	FE; NV-P
Whooping crane[2]	*Grus americana*	FE; CO-SE; UT-SS - Tier I
Western snowy plover	*Charadrius alexandrinus nivosus*	BLM
Piping plover[2]	*Charadrius melodus*	FT; CO-ST
Mountain plover	*Chardrius montanus*	BLM; UT-SS
Long-billed curlew	*Numenius americanus*	BLM; UT-SS - Tier II
Interior least tern[2]	*Sternula antillarum*	FE; CO-SE
Black tern	*Chlidonias niger*	BLM
Yellow-billed cuckoo (western)	*Coccyzus americanus*	FC; BLM; USFS; NV-P; UT-SS – Tier I
Flammulated owl	*Otus flammeoulus*	BLM; USFS
Burrowing owl	*Athene cunicularia*	BLM; CO-ST; UT-SS - Tier II
Mexican spotted owl	*Strix occidentalis lucida*	FT; BLM; CO-ST; UT-SS
Long-eared owl	*Asio otus*	BLM
Short-eared owl	*Asio flammeus*	BLM; UT-SS - Tier II
Boreal owl	*Aegolius funereus*	USFS
Black swift	*Cypseloides niger*	BLM; UT-SS - Tier II
Lewis's woodpecker	*Melanerpes lewis*	BLM; UT-SS - Tier II
Red-naped sapsucker	*Sphyrapicus nuchalis*	BLM, MIS
American three-toed woodpecker	*Picoides dorsalis*	BLM; USFS; MIS; UT-SS - Tier II
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE; BLM; UT-SS - Tier I; CO-SE; NV-P
Loggerhead shrike	*Lanius ludovicianus*	BLM
Gray vireo	*Vireo vicinior*	BLM
Pinyon jay	*Gymnorhinus cyanocephalus*	BLM
Juniper titmouse	*Baeolophus griseus*	BLM
Sage thrasher	*Oreoscoptes montanus*	BLM, MIS
Bendire's thrasher	*Toxostoma bendirei*	BLM; NV-P
Crissal thrasher	*Toxostoma crissale*	BLM
Le Conte's thrasher	*Toxostoma lecontei*	NV-P; BLM
Phainopepla	*Phainopepla nitens*	BLM; NV-P
Lucy's warbler	*Vermivora luciae*	BLM
Yellow-breasted chat	*Icteria virens*	BLM
Brewer's sparrow	*Spizella breweri*	BLM, MIS
Vesper sparrow	*Pooecetes gramineus*	BLM, MIS
Sage sparrow	*Amphispiza belii*	BLM
Grasshopper sparrow	*Ammodramus savannarum*	BLM; UT-SS - Tier II
Bobolink	*Dolichonyx oryzivorus*	BLM; UT-SS - Tier II
Reptiles		
Banded Gila monster	*Heloderma suspectum cinctum*	BLM; NV-P

Table 3.8-6 Species Potentially Occurring in the Special Status Wildlife Analysis Area

Common Name	Scientific Name	Status[1]
Chuckwalla	*Sauromalus obesus*	BLM; UT-SS - Tier II
Corn snake	*Elaphe guttata*	BLM; UT-SS - Tier II
Desert iguana	*Dipsosaurus dorsalis*	BLM; UT-SS - Tier II
Desert night lizard	*Xantusia vigilis*	BLM; UT-SS - Tier II
Desert tortoise	*Gopherus agassizii*	FT; BLM; UT-SS - Tier I; NV-P
Long-nosed leopard lizard	*Gambelia wislizenii*	BLM
Midget faded rattlesnake	*Crotalus viridis concolor*	BLM
Utah milk snake	*Lampropeltis triangulum taylori*	BLM
Mojave rattlesnake	*Crotalus scutulatus*	BLM; UT-SS - Tier II
Sidewinder	*Crotalus cerastes*	BLM; UT-SS - Tier II
Smooth greensnake	*Opheodrys vernalis*	BLM; UT-SS - Tier II
Speckled rattlesnake	*Crotalus mitchellii*	BLM; UT-SS - Tier II
Desert glossy snake	*Arizona elegans eburnata*	BLM
Western banded gecko	*Coleonyx variegates*	BLM; UT-SS - Tier II
Western red-tailed skink	*Eumeces gilberti rubricaudatus*	BLM
Western threadsnake (blindsnake)	*Leptotyphlops humilis*	BLM; UT-SS - Tier II
Zebra-tailed lizard	*Callisaurus draconoides*	BLM; UT-SS - Tier II
Mojave shovel-nosed snake	*Chionactis occipitalis occipitallis*	BLM
Terrestrial Invertebrates		
Eureka mountainsnail	*Oreohelix eurekensis*	BLM; UT-SS
Great Basin silverspot (Nokomis fritillary) butterfly	*Speyeria nokomis nokomis*	BLM
Great Basin small blue (Small blue) butterfly	*Philotiella speciosa septentrionalis*	BLM
Grey's silverspot (Grey's fritillary) butterfly	*Speyeria hesperis greyi*	BLM
Honey Lake blue butterfly	*Euphilotes pallescens calneva*	BLM
MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	*Hesperopsis gracielae*	BLM
Mojave gypsum bee	*Andrena balsamorhizae*	BLM
Mojave poppy bee	*Perdita meconis*	BLM
Mono Basin Skipper (Railroad Valley skipper) butterfly	*Hesperia uncas giulianii*	BLM
Northern Mojave blue (Mojave blue) butterfly	*Euphilotes mojave virginensis*	BLM
Rice's blue butterfly	*Euphilotes pallescens ricei*	BLM
White River wood nymph butterfly	*Cercyonis pegala pluvialis*	BLM

[1] Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; FP = Federal Proposed for listing; EXP/NE = Experimental Non-essential population; BLM = BLM Sensitive; USFS = USFS Sensitive; MIS = USFS Management Indicator Species, CO-E = Colorado State Endangered; CO-T = Colorado State Threatened; NV-P = Nevada State-Protected; UT-SS = Utah Sensitive Species (Tier I and Tier II species are defined in Utah's Comprehensive Wildlife Strategy).

[2] Species is included because of the water depletion evaluation requirement in the Platte River Basin.

3.8.4.1 Federally Listed and Candidate Wildlife Species

A total of 11 federally listed wildlife species (one reptile, seven birds, and three mammals) occur within the special status wildlife analysis area, as well as three federal candidate species (greater sage-grouse, western yellow-billed cuckoo, and wolverine). A summary of the listing status, habitat, and general distribution for the federally listed and federal candidate wildlife species is provided below.

Desert Tortoise (Threatened)

The Mojave population of desert tortoise was designated as threatened in 1989 (54 FR 32326). On October 13, 1989, the USFWS published a proposed rule to list the Mojave population as threatened, but because the emergency rule expired on April 2, 1990, it was necessary to publish the final rule on the same day, in order to prevent a lapse in protection for the tortoise (55 FR 12178). In 1993, a Draft

Recovery Plan was issued. Critical habitat was designated in 1994, encompassing 6.4 million acres within six management units across California, Nevada, Utah, and Arizona (59 FR 5820). In 2011, the USFWS issued a Final Revised Recovery Plan which reduced to five the number of recovery units, and changed some boundaries of the 1994 recovery units (USFWS 2011a).

The desert tortoise inhabits the Mojave and Sonoran deserts of the United States and Mexico. Tortoises of the Mojave population are found primarily in desert shrubland. Typical habitat for the desert tortoise in the Mojave Desert has been characterized as creosote bush scrub below 5,500 feet amsl; where annual precipitation ranges from 2 to 8 inches; the diversity of perennial plants is relatively high; and production of ephemerals is high. In the Mojave Desert, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous plants. Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse (USFWS 2011a).

Adequate burrowing substrate and plants that can provide thermal cover are crucial habitat components for the desert tortoise. In the Mojave region, desert tortoises will construct their own burrows to avoid extreme hot or cold temperatures. Mojave desert tortoises often excavate burrows under vegetation, extending up to 33 feet. In addition to burrows, desert tortoises also construct shallow depressions (pallets) under low shrubs to serve as temporary resting sites.

The USGS has developed a habitat model that ranks desert tortoise potential habitat on a scale from 0 to 1, with 1 being greatest. The desert tortoise analysis area includes areas of high quality habitat that the USGS habitat model values 0.7 to 1.0. The entire desert tortoise analysis area is located within the northeastern Mojave Desert Recovery Unit (USFWS 2008a). Critical habitat units within this recovery unit, and within the desert tortoise analysis area are: 1) Gold Butte-Pakoon Unit, Clark County, Nevada; 2) Beaver Dam Slope Unit, Lincoln, County, Nevada; 3) Beaver Dam Slope Unit, Washington County, Utah; and 4) Mormon Mesa Unit, Clark and Lincoln counties, Nevada (59 FR 5820).

California Condor (Endangered; EXP/NE)

The California condor was designated as endangered on March 11, 1967 (FR 32: 4001). Despite protection, populations continued to decline, and by 1982 only 22 wild condors remained (AZGFD 2008; Peregrine Fund 2008). A decision was made to rely on captive breeding programs for recovery of the species, and the last wild condor was brought into captivity in 1987. In 1992, releases to the wild began in central and southern California, followed by releases in the Vermilion Cliffs area of Arizona in 1996 and in Baja California in 2002.

A special provision of the ESA, the 10(j) rule, allows for the designation of non-essential populations (NEP) of listed species (AZGFD 2008), and re-introduction efforts for the condor were developed under this rule. This listing covers only those populations within the U.S. and excludes the NEPs in specific portions of Arizona, Nevada, and Utah (61 Fed. Reg. 54043-54060). Current re-introduced condor populations are considered 10(j) populations, except where they occur within National Parks where, as noted below, they receive protection under the ESA endangered status.

In Utah, the condor population is considered an NEP south of Interstate 70 and east of Interstate15, except within National Parks. Any condors occurring outside of the experimental population area, including those on National Park lands, are protected under the ESA. In March 2009, a 5-Year Review of the status of the California condor was initiated. Critical habitat is not present within the California condor analysis area. The current recovery plan for the species was issued in April 1996 (Third Revision).

California condors occupy remote rugged areas at low to moderate elevation that support large mammals, which they consume as carrion. These birds require cliff sites or caves for nesting and cliffs, tall conifers, or snags for roosting (Snyder and Rea 1998). Because they are such large birds, they typically select roosting sites near cliffs where updrafts provide adequate lift for them to take flight (AOU 2004;

AZGFD 2008, 2004; Snyder and Rea 1998; USFWS 1996). The California condor analysis area is the HUC 10 watersheds crossed by the Project in Region III.

As of March, 2011, there were 97 wild condors in California, 74 in Arizona, and 20 in Baja California, for a total of 191 wild condors (AZGFD 2008). The current range of the condor population in Arizona is centered on the Colorado River Basin in northern Arizona and southern Utah. This population occurs outside the California condor analysis area, however; condors regularly forage, roost, and may nest in southern Utah. Condors commonly occur in Utah between April and November, but peak numbers usually occur from June through August. Condors can travel up to 200 miles in a day (UDNR 2011). Therefore, they could occur within the California condor analysis area (Gorell et al. 2005).

Greater Sage-grouse (Candidate)

Sagebrush steppe habitats across the western U.S. have been substantially altered, fragmented, and lost due to the introduction of invasive plant species, changes in fire regimes, and direct removal resulting from changes in land use (Knick et al. 2003; Knick and Connelly 2011). On February 26, 2008, the USFWS initiated a status review to determine whether the greater sage-grouse warranted protection under the ESA (73 FR 10218). On March 5, 2010, the USFWS determined that the greater sage-grouse warrants protection under the ESA; however, listing was precluded by the need to take action on other species facing more immediate and severe extinction threats. The USFWS concluded that the greater sage-grouse would be added to the candidate species list. Therefore, greater sage-grouse in Wyoming, Colorado, and Utah continue to be managed by the WGFD, CPW, and UDWR, respectively. Greater sage-grouse populations in Nevada are managed by NDOW and do not occur in areas potentially impacted the project. Currently, federally listed candidate species receive no statutory protection under ESA. Conservation efforts for this species in Wyoming, Colorado, and Utah are currently coordinated by the WGFD, CPW, and UDWR in cooperation with the USFWS, BLM, USFS, and greater sage-grouse working groups in an attempt to increase population levels and avoid federal listing under the ESA.

In an effort to prevent federal listing of the greater sage-grouse, Wyoming, Utah, Colorado, and Nevada have developed Greater Sage-grouse Management/Conservation Plans that outline goals and objectives for managing the species (CGSSC 2008; South Central Sage-grouse Working Group 2007; Southwest Wyoming Local Sage-grouse Working Group 2007; State of Nevada 2012; UDWR 2009). In addition, the Wyoming BLM and the State of Wyoming have issued several regulations regarding management of the greater sage-grouse in Wyoming. BLM Instruction Memoranda (IM) 2010-012, 2012-043, 2012-044, 2012-019, and State of Wyoming Executive Order 2011-5 include specific protection measures guiding development in greater sage-grouse habitat, specifically in core population areas. The WGFD has developed a map of greater sage-grouse core population areas in Wyoming. Greater sage-grouse core population areas include areas with the highest densities of breeding greater sage-grouse in the state, as well as areas important for connectivity between populations. The core population areas include roughly 25 percent of the state but contain 83.1 percent of the greater sage-grouse population in Wyoming.

BLM IM 2012-043 and BLM IM 2012-019 provide direction to field managers to ensure that interim conservation procedures are implemented when field offices authorize or carry out activities on public land while the BLM reviews how to best incorporate long-term conservation measures for greater sage-grouse into applicable Land Use Plans (LUPs). These interim conservation measures are consistent with the BLM's National Strategy for protecting and managing greater sage-grouse and incorporate the following principles:

1. Protection of un-fragmented habitats;
2. Minimization of habitat loss and fragmentation; and
3. Management of habitats to maintain, enhance, or restore conditions that meet greater sage-grouse life history needs.

BLM IM 2012-043 identifies policies and procedures that are to be applied to on-going and proposed BLM activities within areas identified as PPH and PGH. PPH consists of areas that have been identified as having the highest conservation value for maintaining sustainable greater sage-grouse populations. These areas include breeding, nesting, brood-rearing, and wintering habitats. PGH is identified as all other areas occupied either seasonally or year-round by greater sage-grouse. Among the conservation policies and procedures presented in BLM IM 2010-043, those that apply to the Project direct the BLM to:

1. Provide documentation of reasoning for ROW determinations and to require the ROW holder to implement measures to minimize impacts to greater sage-grouse habitat;
2. In cooperation with respective state wildlife agencies, consider the opportunities for both on-site and off-site mitigation measures to avoid or minimize habitat and population level impacts; and
3. In cooperation with respective state wildlife agencies, determine that the proposed ROW would cumulatively maintain or enhance greater sage-grouse habitat.

BLM IM 2012-044 provides the BLM direction to incorporate conservation measures identified in the 2011 report on national greater sage-grouse conservation measures published by the Sage-grouse National Technical Team (NTT 2011). NTT conservation measures relating to ROWs include:

1. Designating priority greater sage-grouse habitat areas as exclusion areas for new ROW permits;
2. Evaluating the feasibility of removing, burying, or modifying existing power lines within priority greater sage-grouse habitat; and
3. Designating greater sage-grouse general habitat areas as avoidance areas for new ROW permits.

Lekking/Breeding/Nesting Habitat

The center of breeding activity for the greater sage-grouse is referred to as a strutting ground or lek. Leks are characterized as flat, sparsely vegetated areas within large tracts of sagebrush (Connelly et al. 2004). Males begin to appear on leks in March, with peak attendance of Utah leks occurring in late-March and peak attendance in Colorado and Wyoming leks occurring in April (CGSSC 2008; UDWR 2009; WGFD 2003). Nesting generally commences 1 to 2 weeks after mating and may continue as late as early June (UDWR 2009). Greater sage-grouse nesting habitat typically is centered around active leks and consists of medium to tall sagebrush with a perennial grass understory (Connelly et al. 2000). Studies have shown that taller sagebrush with larger canopies and more residual understory cover usually lead to higher nesting success for this species (Connelly et al. 2004, 2000).

Brood-Rearing Habitat

During late spring and summer, hens and broods typically are found in more lush habitats consisting of a high diversity of grasses and forbs that attract insects. These habitats include wet meadows, riparian areas, and irrigated farmland within or near sagebrush. Hens with broods utilize these habitats until forbs desiccate and insect abundance decreases. Unsuccessful hens and cocks also will utilize these same habitats; however, due to their nutritional flexibility, they are able to occupy a wider variety of habitats during the spring and summer months (Connelly et al. 2004). In many greater sage-grouse populations, limited availability of high quality brood-rearing habitat often negatively impacts recruitment. Factors affecting the availability of brood-rearing habitat include drought, non-native grass and weed invasions, overgrazing associated with historic improper range management strategies (Oakleaf 1971; Klenbow 1985, 1982), and sagebrush removal.

Wintering Habitat

Depending on the severity of the winter, greater sage-grouse move to south- and west-facing slopes that maintain exposed sagebrush. Studies have shown that south-facing slopes with sagebrush at least 10 to

12 inches above the snow level are required for both food and cover. Windswept ridges, draws, and swales also may be used, especially if these areas are in close proximity to exposed sagebrush (Connelly et al. 2004). In years with severe winter conditions (i.e., deep snow), greater sage-grouse often gather in large flocks in areas with the highest quality winter habitat. It is suggested that high quality winter habitat is limited in portions of the greater sage-grouse's range (Connelly et al. 2000). Wintering habitat for greater sage-grouse has been defined for populations in Colorado and Utah, and is currently being defined for populations in Wyoming (WGFD 2012).

Overall Species Range

In Wyoming, the greater sage-grouse occurs throughout the state in appropriate habitat (Cervoski 2004). Colorado is on the southeastern edge of the known distribution for this species. Within the greater sage-grouse analysis area in Colorado, the species is likely to be found in Moffat and Rio Blanco counties (CGSSC 2008). Scattered populations of greater sage-grouse occur throughout Utah, excluding the Colorado Plateau region in the southeastern portion of the state. The largest populations within the Utah portion of the greater sage-grouse analysis area are in Uintah County, but smaller populations occur throughout central and southern portions of the state (UDWR 2009). The species also occurs outside of the greater sage-grouse analysis area in central Nevada, southern Idaho, southeastern Oregon, central Washington, eastern Montana, western North Dakota, western South Dakota, and northeastern California. The greater sage-grouse analysis area includes core areas within HUC 10 watersheds crossed by the Project in Wyoming, PPH and PGH within HUC 10 watersheds crossed by the Project in Colorado, and occupied (includes brood-rearing and wintering) habitat Utah. In Nevada, Alternative III-C crosses the southern boundary of the Lincoln Sage Grouse PMU but does not cross any occupied greater sage-grouse habitat.

Whooping Crane (Endangered)

The whooping crane was listed as endangered on March 11, 1967 (32 FR 4001). In May 2007, the third revision of the Whooping Crane Recovery Plan was issued (72 FR 29544). Critical habitat for the whooping crane is not present in the special status wildlife analysis area (USFWS 2011b). As of August 2011, the total population of whooping cranes in the wild was estimated at 437.

Whooping cranes nest in, and adjacent to, the Aransas-Wood Buffalo National Park (AWBP) in Canada, and winter in coastal marshes in Texas at the Aransas National Wildlife Refuge (USFWS 2011b). During spring and fall migration, the AWBP whooping crane population migrates through the central Great Plains. Birds from the AWBP population depart from their wintering grounds in Texas starting in late March through the beginning of May. Fall migration typically begins in mid-September, with most birds arriving on wintering grounds between late October and mid-November (CWS and USFWS 2005).

Whooping cranes utilize a variety of habitats during migration, including freshwater marshes, wet prairies, shallow portions of rivers, reservoirs, lakes, and lagoons; and forage in grain and stubble fields. Whooping cranes roost on submerged or barren sandbars.

The occurrence of this species within the special status wildlife analysis area would be limited to accidental migrants from the Aransas-Wood Buffalo population, and is highly unlikely. No new depletions will occur by the proposed Project in the Platte River system in Wyoming. No impacts are expected to the whooping crane and no whooping crane analysis area has been defined for the Project.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail was designated as endangered on March 11, 1967 (32 FR 4001).This listing protects only the populations in California and Arizona; Mexican populations are not protected. No critical habitat has been designated for this subspecies. The Yuma Clapper Rail Recovery Plan was issued in 1983. A draft Revised Recovery Plan was issued on February 10, 2010.

The Yuma clapper rail is a subspecies of clapper rail. This subspecies breeds and forages in freshwater marshes with dense vegetation exceeding 16 inches in height, and water depth of 12 inches or less. Important habitat components include pond openings, flowing channels, and emergent soils. Yuma clapper rails that remain near their breeding grounds through the winter occupy tall, dense bulrush/cattail stands. They also utilize flooded salt cedar and willow stands (Rosenberg et al. 1991). Yuma clapper rails were originally thought to migrate to Mexico because they were not detected on their breeding grounds in the U.S. during the winter months (Todd 1986). It is possible that Yuma clapper rails were not detected during the winter because wintering populations are almost completely silent (Rosenberg et al. 1991).

The Yuma clapper rail was formerly restricted to an area near Yuma, Arizona, but has since expanded its range. Over 70 percent of the breeding population of this subspecies winters along the lower Colorado River (Rosenberg et al. 1991). The species potentially occurs only in the far southern limit of the Yuma clapper rail analysis area in southern Nevada along the Muddy River. The Yuma clapper rail analysis area is defined as herbaceous wetland areas along the Muddy River in Nevada within 0.5 mile of the 2-mile transmission line corridor.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The gray wolf (northern Rocky Mountain population) was designated as endangered on January 4, 1974 (39 FR 1175-1176) and a Recovery Plan was released on August 3, 1987. Currently, the species is listed as endangered in Utah and Colorado. The USFWS designated the gray wolf as an NEP in Wyoming. This status is defined as a reintroduced population believed not to be essential for the survival of the species, but important for its full recovery and eventual removal from the endangered and threatened list. These NEP populations are treated as threatened species, except that the Endangered Species Act (ESA) Section 7 regulations, which require consultation to reduce adverse impacts from federal actions do not apply (except when the species occurs within national parks or NWRs) and critical habitat cannot be designated.

The established northern Rocky Mountain population recovery goal of 30 breeding pairs of wolves well distributed throughout Idaho, Montana, and Wyoming for three consecutive years was achieved in December 2002. By 2007, the gray wolf population exceeded 1,500 individuals and the USFWS proposed delisting. The gray wolf population in the northern Rocky Mountains of Montana, Idaho, and Wyoming continued to increase its distribution and estimated wolf numbers have exceeded 1,600 individuals in recent years within the three-state area (USFWS et al. 2009). On March 28, 2008, the USFWS designated and removed the northern Rocky Mountain gray wolf from listing under the ESA (73 Federal Register 10514-10560). However, in July 2008, a federal judge issued an injunction to suspend this removal. A number of environmental groups have challenged the USFWS delisting decision. On March 6, 2009, Secretary Salazar confirmed the USFWS decision to delist the wolf in all states except Wyoming. In March 2011, the northeastern corner of Utah — east of Interstate 15 and north of I-80 and I-84 — was designated as a recovery area for gray wolves. Elsewhere in Utah, most notably the Uinta Mountains and the Book Cliff region of eastern Utah, the species remains protected. Colorado has no established gray wolf population, but has developed guidelines in anticipation of a time when strays from the northern Rocky Mountain population may become established in the state (Wolf Management Working Group 2004).

Gray wolves are considered habitat generalists and have few specific habitat requirements for survival. These requirements are primarily related to the density of prey species found within a given area. Wolf populations have been expanding since the northern Rocky Mountain reintroduction effort, which began in 1995 and 1996. Since the gray wolf utilizes a wide variety of habitats, the species could potentially be present along any portion of the project route regardless of habitat type, with the exception of intensively managed agricultural areas. The gray wolf analysis area includes the HUC 10 watersheds traversed by the Project in Regions I and II.

Interior Least Tern (Endangered)

The interior least tern was designated as endangered on May 28, 1985 (50 FR 21784). No critical habitat has been designated for this subspecies, but essential breeding habitat has been identified within its historic range (USFWS 2011c). The Interior Least Tern Recovery Plan was issued in September 1990.

Historically, the breeding range of this subspecies extended from Texas to Montana and from eastern Colorado and New Mexico to southern Indiana. It included the Rio Grande, Red, Missouri, Arkansas, Mississippi, and Ohio river systems. The interior least tern continues to breed in most of the historic river systems, although its distribution generally is restricted to less altered river segments (USFWS 1990). The interior least tern breeds and forages on barren or sparsely vegetated sandbars adjacent to waterbodies. This subspecies nests in colonies on sandy or pebbly, sparsely vegetated islands or shorelines. Interior least terns spend 4 to 5 months at their breeding sites. Nest locations are usually well above the water's edge, since nesting is typically initiated during high river flows, when only small amounts of sandy shoreline are exposed. Therefore, the size of nesting habitat depends on water levels and the extent of associated sandbars. The interior least tern also will nest on artificial habitats, including sand and gravel pits and dredge islands (USFWS 1990).

It is unlikely that nesting interior least terns would be present within the special status wildlife analysis area. No new depletions will occur by the proposed Project in the Platte River system in Wyoming. No impacts are expected to the interior least tern and no interior least tern analysis area has been defined for the Project.

Piping Plover (Threatened)

The piping plover was designated as endangered/threatened on December 11, 1985 (50 FR 50726). The Great Lakes piping plover population was listed as threatened, while the remaining Atlantic and northern Great Plains populations were listed as threatened. Migrating and wintering populations of piping plover also were classified as threatened. Designated critical habitat for the piping plover does not exist within the special status wildlife analysis area. A recovery plan for the Great Lakes and Northern Great Plains Piping Plover populations was issued on May 12, 1988. The 5-Year Review for this population was issued in September 2009.

The piping plover breeds and forages on sandy lakeshore beaches, sandbars within riverbeds, or sandy wet pastures. Nesting habitat for the piping plover consists of sparsely vegetated shorelines around small alkali lakes, large reservoir beaches; river islands and adjacent sandpits; and shorelines associated with industrial ponds. It constructs a scrape nest in sand or gravel (Haig and Plissner 1993). Nesting piping plovers have been found in least tern nesting colonies at a number of sites on Great Plains river sandbars and sand pits (USFWS 1988).

It is unlikely that nesting piping plovers would be present within the special status wildlife analysis area. No new depletions will occur by the proposed Project in the Platte River system in Wyoming. No impacts are expected to the piping plover and no piping plover analysis area has been defined for the Project.

Western Yellow-billed Cuckoo (Candidate)

The Western U.S. Distinct Population Segment (DPS) of the yellow-billed cuckoo became a candidate species for listing as threatened or endangered on October 30, 2001 (66 FR 54807-54832). Currently, federally listed candidate species receive no statutory protection under ESA.

Western populations of yellow-billed cuckoos breed in dense riparian woodlands along riparian corridors in otherwise arid areas (Hughes 1999). Dense undergrowth may be an important factor in selection of nest sites (Ehrlich et al. 1988). Western yellow-billed cuckoos appear to require relatively large tracts of riparian woodland. Several studies have reported the species to only nest in tracts greater than 25 acres in size.

The range of the western population of yellow-billed cuckoo has been determined as the portion of yellow-billed cuckoo range west of the crest of the Rocky Mountains (USFWS 2001). Currently the western yellow-billed cuckoo is very rare in scattered drainages in western Colorado, Idaho, Nevada, and Utah (NatureServe 2008). The species has been documented within the special status wildlife analysis area in Utah County, Utah. It also has been documented within 5 miles of the special status wildlife analysis area in Emery, Grand, Uintah, and Washington counties, Utah (UNHP 2010). The species has been documented in Meadow Valley Wash in Lincoln County, Nevada (NNHP 2010). It also is a confirmed breeder along the Muddy River in Nevada (Floyd et al. 2007). The western yellow-billed cuckoo analysis area is defined as areas within 0.5 mile of perennial waterbodies with developed riparian woodlands within the HUC 10 watersheds crossed by the Project.

Mexican Spotted Owl (Threatened)

The Mexican spotted owl was designated as threatened on March 16, 1993 (58 FR 14248-14271), and a Recovery Plan was released on June 6, 1995 (60 FR 29913-29951). Critical habitat was originally designated on March 16, 1993 (58 FR 14248-14271), and subsequently revoked on March 25, 1998 (63 FR 14378-14379). Critical habitat was re-established on February 1, 2001 (66 FR 8530-8553), and a comment period was re-opened on November 18, 2003 (68 FR 65020-65023). The currently defined critical habitat was established on August 31, 2004 (69 FR 53181-53298).

The Mexican spotted owl is one of three recognized subspecies of spotted owl in North America. The Mexican spotted owl is a permanent resident in the interior mountain ranges of western North America, ranging from southern Utah and central Colorado south through the mountains of Arizona, New Mexico, and extreme west Texas. The species typically occupies old growth forest in mixed conifer, pine-oak woodland, deciduous riparian, or a combination of these habitats that will support a home range of 1,400 to 4,500 acres (Ehrlich et al. 1988; Gutierrez et al. 1995). An undisturbed core area of approximately 600 acres centered on the nest site is the currently recommended disturbance buffer (Gutierrez et al. 1995).

Mexican spotted owls typically inhabit steep canyons with mature or old growth forest, but they also may occur in canyons with steep cliffs and relatively little forest habitat. Mexican spotted owl habitat typically has a structured canopy, a perennial water source, and a rodent-dominated prey base of adequate size (Gutierrez et al. 1995). Mexican spotted owls have been reported at elevations ranging from 3,700 feet amsl to the subalpine transition zone (Ganey 1998; Gutierrez et al. 1995; Johnsgard 1988).

Mexican spotted owls exhibit high nest fidelity and construct nests in rock crevices, tree cavities (usually in live trees) or on constructed platforms on tree limbs. In Utah, they nest almost exclusively in shallow caves (Gorell et al. 2005). Mexican spotted owls also will utilize abandoned raptor or corvid platform nests (Ehrlich et al. 1988; Terres 1980).

There are several areas where the subspecies could occur within the Mexican spotted owl analysis area in Utah including; the Desolation Canyon area of the Green River on the boundary between Carbon and Uintah Counties; and the Kolob Terrace area (including Zion National Park) near Cedar City (Gorell et al. 2005; UCDC 2008). The Mexican spotted owl analysis area is defined as the modeled habitat in the BLM Vernal Field Office. Although modeled habitat for other BLM field offices was not available for inclusion in this analysis, occurrences of this species in the Zion National Park area have been recorded. Therefore, this species and its habitat could potentially be impacted by project alternatives in southwestern Utah.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher was designated as endangered, without designated critical habitat, on February 27, 1995 (60 FR 10693-10715). Critical habitat was later designated on July 22, 1997 (62 FR 39129-39147), and the Final Recovery Plan for the subspecies was issued on March 5, 2003 (68 FR 10485). A court decision in 2001 resulted in a subsequent Final Rule on Critical Habitat on

October 19, 2005 (70 FR 60885-61009). A 5-year review of the subspecies was completed by the USFWS in 2005 (73 FR 14995-14997).

Four specific types of breeding habitat have been described for the southwestern willow flycatcher. The first is comprised of dense stands of willows 10 to 23 feet in height, with no distinct overstory. This community is often associated with sedges, rushes, or other herbaceous wetland plants. A second habitat type includes dense stands of salt cedar or Russian olive up to 33 feet in height. These species form a dense, closed canopy, with no distinct understory layer. Native broadleaf-dominated communities form a third habitat type. The final habitat type is a mixture of native and exotic riparian species (Sogge et al. 1997).

Regardless of the vegetation species composition, all of these habitats share common structural characteristics. Occupied southwestern willow flycatcher habitats always have dense vegetation in the interior, and dense areas are often interspersed with small clearings, open water, or areas of sparse shrubs. Habitat patches can vary in size and shape, with some occupied areas being relatively dense, linear, contiguous stands, and others being large, irregularly shaped mosaics of dense vegetation intermingled with open areas. Habitat patch sizes can range from as little as 2 acres to several hundred or a thousand acres. Southwestern willow flycatchers may occur at elevations as high as 7,875 feet amsl. They also inhabit willow or cottonwood riparian areas that extend out into desert regions (Terres 1980). Migration and winter habitat could differ from breeding habitat for this subspecies. During migration, riparian habitat along major southwestern drainages is commonly utilized, but a close association with water may not always exist. These drainages might be considered stopover areas, and could be very important migration habitat for the southwestern willow flycatcher (USFWS 2002).

The southwestern willow flycatcher has been documented within 5 miles of the 2-mile transmission line corridor in Washington County, Utah (UNHP 2010). It also has been documented in Iron County, Utah, near Newcastle Reservoir and Pinto Creek. Suitable habitat occurs in Emery, Grand, Iron, and Uintah counties, Utah, and in Clark and Lincoln counties, Nevada. Designated critical habitat exists in Clark County, Nevada and in Washington County, Utah. Additional critical habitat is proposed in Clark and Lincoln counties, Nevada, and Washington County, Utah (USFWS 2011d). In the Nevada portion of the southwestern willow flycatcher analysis area, essential habitat for the southwestern willow flycatcher is identified on the Pahranagat and Muddy rivers, and a portion of the Virgin River. Designated critical habitat consists of the Virgin River contiguous with the essential habitat section, upstream to the Arizona border. The entire segment of the mainstem Virgin River in Arizona is within designated critical habitat, and an approximately 18 mile-long segment of the river further upstream into Utah also is a part of this unit. The total length of critical habitat on the Virgin River is 73 miles (USFWS 2005a). Other potential suitable habitat for the southwestern willow flycatcher in Nevada includes portions of the Meadow Valley Wash, the Muddy River, Las Vegas Wash, and the Colorado River System (Hiatt and Boone 2003). The southwestern willow flycatcher analysis area is defined as the following Management Units within the Lower Colorado Recovery Unit: Pahranagat, Virgin, western portion of the Middle Colorado, Hooter-Parker, and southern portion of the Amargosa. Also included in the southwestern willow flycatcher analysis area is the area within 0.5 mile of the riparian corridor at Newcastle Reservoir and Pinto Creek, which is crossed by the Project.

Black-footed Ferret (Endangered; EXP/NE)

The black-footed ferret was designated as endangered in 1966. The species was subsequently listed as threatened with extinction under the Endangered Species Preservation Act on March 11, 1967 (32 FR 4001) and as endangered under the Endangered Species Act on June 2, 1970 (35 FR 8491). No critical habitat has been designated for the species. Eight reintroduced black-footed ferret populations have been designated as NEP under Section 10(j) of the ESA. The USFWS initiated a 5-year species status review for the black-footed ferret on July 7, 2005 (70 FR 39326). In the 2008 status review summary, the USFWS recommended no change in status and a Recovery Priority Number of 2C (USFWS 2008b). The current Black-footed Ferret Recovery Plan was approved in 1988 (USFWS 1988). This plan replaced the 1978

recovery plan, which was drafted when no extant, wild black-footed ferrets were known to exist (USFWS 1988).

The black-footed ferret is considered to be a prairie dog obligate species. The black-footed ferret is entirely dependent upon prairie dogs colonies, utilizing the burrows for shelter and den sites, and preying almost exclusively on prairie dogs (Biggins et al. 2006).

No wild black-footed ferret populations are known to occur within the black-footed ferret analysis area in Wyoming. Although the Shirley Basin supports the only known extant population of wild black-footed ferrets in Wyoming, there are numerous white-tailed prairie dog complexes within the black-footed ferret analysis area for both the Rawlins and Rock Springs BLM Field Offices that constitute suitable habitat for the black-footed ferret. Many of these complexes have not been surveyed for black-footed ferrets. The State of Wyoming is now entirely block-cleared for the black-footed ferret (USFWS 2013).

Besides the Shirley Basin reintroduction site in south-central Wyoming, there is only one other reintroduction site within the black-footed ferret analysis area: the Northwestern Colorado/Northeastern Utah Black-footed Ferret Experimental Population Area (ExPA). The ExPA encompasses portions of Rio Blanco and Moffat counties in Colorado, Sweetwater County, Wyoming, and Uintah and Duchesne counties, Utah. The ExPA has been separated into the Northwestern Colorado Experimental Population Sub-Area and the Northeastern Utah Experimental Population Sub-Area. Within the Northwestern Colorado Sub-Area, the Little Snake Black-footed Ferret Management Area was established as a specific reintroduction site. The Little Snake area is located in northwestern Moffat County, Colorado along the Colorado-Wyoming border. Within the Northeastern Utah Sub-Area, the Coyote Basin Black-footed Ferret Management Area was established as a specific reintroduction site. The Coyote Basin area is located in Uintah County, Utah along the Utah-Colorado state border.

A total of 255 black-footed ferrets have been released into the Coyote Basin Area since 1999. Reproduction was confirmed in Coyote Basin in 2000, and the population is currently estimated at 25 individuals (USFWS 2008b). Ferret releases at the Wolf Creek site northeast of Rangely, Colorado, were initiated in 2001, and to date a total of 189 individuals have been released at this location. The Wolf Creek population is currently estimated at 16 individuals (USFWS 2008b); although plague has impacted the Wolf Creek population of white-tailed prairie dogs and black-footed ferrets in recent years and no black-footed ferrets have been documented during surveys in 2009, 2010, and 2011. The USFWS classifies both populations as “marginal” (USFWS 2008b). The only non-NEP areas found within the black-footed ferret analysis area are located in Grand, Emery, or Carbon counties, Utah, and portions of Sweetwater and Carbon counties, Wyoming. The black-footed ferret analysis area includes the ExPA in Utah and Colorado, and the Continental Divide (2), Dad, and Desolation Flats non-block cleared areas in Wyoming.

Canada Lynx (Threatened)

The contiguous U.S. Distinct Population Segment (DPS) of the Canada lynx was designated as threatened on March 24, 2000 (65 FR 16051). This DPS includes lynx inhabiting forested portions of multiple states, including Colorado and Utah. In response to a 2002 court order, the USFWS reconfirmed the species’ status as threatened (68 FR 40076). A final rule on critical habitat for the Canada lynx was issued in February 2009. Designated critical habitat does not exist within the Canada lynx analysis area. A 5-year species status review was initiated in 2007 (72 FR 19549). Although a formal recovery plan has not been published for the Canada lynx, an interim Recovery Outline was issued in 2005 to guide recovery efforts and critical habitat designation for the DPS until a draft recovery plan is completed (USFWS 2005b). The Recovery Outline identifies preliminary Canada Lynx Recovery Areas throughout the contiguous United States. These areas are categorized as Core Areas, Provisional Core Areas, Secondary Areas, and Peripheral Areas based upon habitat quality and evidence of current Canada lynx occurrence.

At the time of listing, the USFWS identified the main threat to the DPS as the inadequacy of existing regulatory mechanisms to protect the Canada lynx and its habitat; particularly the lack of protection conferred by USFS Land and Resource Management Plans (65 FR 16051). To address this inadequacy, the USFS, BLM, and USFWS developed the Lynx Conservation Assessment Strategy (LCAS) to provide a consistent and effective approach to conserve Canada lynx on federal lands across the contiguous U.S. (Ruediger et al. 2000). The LCAS included the identification of Lynx Analysis Units (LAUs). LAUs are based upon 5th and 6th level Hydrologic Unit Codes (HUC), and a HUC becomes a LAU when at least 30 percent of the HUC is suitable Canada lynx habitat. LAUs have been identified in suitable lynx habitat throughout lands managed by the USFS and BLM.

The Canada lynx inhabits the boreal forests of North America. Lynx are secretive, nocturnal, and solitary. Home range sizes vary widely, depending on prey availability and regional habitat characteristics (Meaney and Beauvais 2004). Canada lynx require a complex mosaic within their home range to meet different habitat needs. Specifically, lynx utilize early successional habitats for foraging and mature forests with large woody debris for denning (Ruediger et al. 2000). While Canada lynx populations in northern boreal habitats are known to oscillate in direct response to natural snowshoe hare population cycles, southern populations rely more heavily on alternate prey species and do not exhibit the dramatic cycles experienced by northern populations.

The species has been documented within 5 miles of the 2-mile transmission line corridor in Uintah County, Utah, and Carbon County, Wyoming (UNHP 2010; WNHP 2010). Additionally, a reproducing population has been established in south-central Colorado as a result of a reintroduction program initiated in 1999 by the CPW and individuals from this population have been documented in northern Colorado and Utah. The Canada lynx analysis area is defined as forested habitat within the special status wildlife analysis area in Regions I and II.

Utah Prairie Dog (Threatened)

The Utah prairie dog was designated as endangered in 1968, but was subsequently delisted in1970. It was again designated as endangered on June 4, 1973, due to a substantial decline in population from 1970 to 1972 (Pizzimenti and Collier 1975). In 1979 the UDWR petitioned the USFWS to remove the Utah prairie dog from the endangered species list. The USFWS published a Final Rule on May 29, 1984 (49 FR 22330), to reclassify the Utah prairie dog as threatened, with a special rule to allow regulated take. In 2003, the USFWS received a petition to reclassify the species as endangered. In February 2004, the USFWS received a Notice of Intent to Sue for failure to issue a 90-day finding for the petition. Eventually the petitioning party and the USFWS reached a settlement agreement to make a 90-day finding on the petition by February 17, 2007. Published in the Federal Register on February 21, 2007, the USFWS issued a notice of the 90-day petition finding that the petition failed to provide substantial scientific or commercial information to warrant the reclassification of the species to endangered status (72 FR 7843). With this determination, the USFWS also initiated a 5-year review of the species to determine whether the status of the Utah prairie dog should be changed. The Final Recovery Plan for the Utah Prairie Dog was issued on September 9, 1991 (USFWS 1991).

The Utah prairie dog is a colonial species. It inhabits grassland and shrublands in central Utah, and is found at elevations ranging from approximately 4,900 to 9,800 feet amsl (Hoogland 2006). Because most of their water requirement is met through plant ingestion, there is a positive correlation between the amount of available moisture in vegetation and Utah prairie dog population densities. The species prefers swale formations where moist vegetation is available even during times of drought (USFWS 1991). Utah prairie dogs require well-drained soils for their burrows in order to be able to burrow deeply enough to be protected from predators and environmental temperature extremes (USFWS 1991). Colony population densities vary considerably (6.25 per acre to more than 185 per acre). Habitat condition is the most likely influence on population density (Pizzimenti and Collier 1975). Vegetation within a colony must be low enough to allow a standing Utah prairie dog to scan the environment for predators. Utah prairie dogs are true hibernators, and most surface activity ceases during harsh winters (72 FR 7843).

The Utah prairie dog has the most restricted range of all prairie dog species in the U.S. and is limited to the southwestern quarter of Utah (USFWS 1991). As of 2010, Utah prairie dog populations existed in only three areas: the Awapa Plateau; the Paunsaugunt region along the east fork and main stem of the Sevier River; and the West Desert region of eastern Iron County (USFWS 2010). Several isolated colonies exist in the mountain and desert valleys in western Iron and Beaver counties (Pizzimenti and Collier 1975; USFWS 1991).

Distribution records for the Utah prairie dog since 1983 show occurrences in Beaver, Garfield, Iron, Millard, Piute, Sanpete, Sevier, and Washington counties (Bosworth 2003). The species has been documented within the Utah prairie dog analysis area in Iron, Millard, and Sevier counties, Utah (UNHP 2010). The greatest concentrations of Utah prairie dogs occur in eastern Iron and southern Sevier counties. The Utah prairie dog analysis area is defined as the West Desert Recovery Unit, Paunsaugunt Recovery Unit, and the Awapa Plateau Recovery Unit.

3.8.4.2 BLM Sensitive, USFS Sensitive, USFS MIS, and State-Protected Wildlife Species

In addition to federally listed and candidate species, a total of 106 BLM, USFS, or state-protected species potentially occur within the special status wildlife analysis area (**Table 3.8-6**). This list includes 12 terrestrial invertebrate species, 18 reptile species, 42 bird species, and 34 mammal species. Descriptions of occurrence and habitat utilized by these species are provided in **Appendix G**, **Table G-2**.

3.8.5 Regional Summary

Special status wildlife species by Project region are summarized in **Table 3.8-7**.

Table 3.8-7 Summary of Special Status Wildlife Species by Terminal and Project Region

Species	Total Species Within the Special Status Wildlife Analysis Area (All Regions)[2]	Northern Terminal	Proposed Alternative Southern Terminal	Alternate Southern Terminal	Southern Terminals near IPP (DO2 and DO3)	Region I	Region II	Region III	Region IV
Mammals – Bats	20	12	20	20	18	13	16	19	20
Mammals – Other	18	7	4	4	4	13	13	7	4
Birds[1]	51	23	12	12	20	38	36	34	23
Reptiles	19	4	13	13	10	4	5	14	15
Terrestrial Invertebrates	12	0	5	5	8	1	2	10	7
Total	120	46	54	54	60	69	72	84	69

[1] Includes whooping crane, interior least tern, and piping plover.

[2] Total number of species is not equal to a sum of regions and other project components due to the fact that most species are present in multiple regions.

3.8.5.1 Northern Terminal

Vegetative communities located within the Northern Terminal siting area include: cliff and canyon, grassland, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, and woody riparian and wetlands. Direct impacts resulting from the construction of the terminal and associated facilities could occur within grassland, greasewood flat, sagebrush shrubland, and saltbush shrubland vegetative communities only. A description of these communities is presented in Section 3.5, Vegetation.

Table 3.8-8 presents special status wildlife species potentially occurring at the Northern Terminal.

Table 3.8-8 Special Status Wildlife Species Potentially Occurring at the Northern Terminal

Mammals - Bats		
Big brown bat	California myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western Pipestrelle	Western small-footed myotis	Yuma myotis
Mammals - Other		
Pygmy rabbit	River otter	Swift fox
White-tailed prairie dog	Wyoming pocket gopher	
Birds		
Least bittern	White-faced ibis	Trumpeter swan
Barrow's goldeneye	Bald eagle	Swainson's hawk
Ferruginous hawk	Golden eagle	Greater sage-grouse
Mountain plover	Long-billed curlew	Black tern
Burrowing owl	Long-eared owl	Short-eared owl
Loggerhead shrike	Sage thrasher	Yellow-breasted chat
Brewer's sparrow	Vesper sparrow	Sage sparrow
Grasshopper sparrow	Bobolink	
Reptiles		
Corn snake	Long-nosed leopard lizard	Midget faded rattlesnake
Smooth greensnake		

3.8.5.2 Proposed Alternative Southern Terminal

The Proposed Alternative Southern Terminal would be sited almost entirely within the developed/disturbed vegetation community. This category is not considered to be typical wildlife habitat and no special status wildlife species would be expected to occur in this community. A small amount of desert shrubland also would be within the siting area of the Proposed Alternative Southern Terminal. **Table 3.8-9** presents special status wildlife species potentially occurring at the Proposed Alternative Southern Terminal.

Table 3.8-9 Special Status Wildlife Species Potentially Occurring at the Proposed Alternative Southern Terminal

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Cave myotis	Fringed myotis	Greater western mastiff bat
Hoary bat	Long-eared myotis	Long-legged myotis
Pallid bat	Silver-haired bat	Spotted bat
Townsend's (Western) big-eared bat	Western pipistrelle	Western red bat
Western small-footed myotis	Yuma myotis	

Table 3.8-9 Special Status Wildlife Species Potentially Occurring at the Proposed Alternative Southern Terminal

Mammals - Other		
Dark kangaroo mouse	Desert bighorn sheep	Kit fox
Pale kangaroo mouse		
Birds		
Swainson's hawk	Ferruginous hawk	Golden eagle
Peregrine falcon	Prairie falcon	Burrowing owl
Long-eared owl	Gray vireo	Bendire's thrasher
Crissal thrasher	LeConte's thrasher	Phainopepla
Reptiles		
Banded Gila monster	Chuckwalla	Desert glossy snake
Desert iguana	Desert night lizard	Long-nosed leopard lizard
Mojave rattlesnake	Movave shovel-nosed snake	Sidewinder
Speckled rattlesnake	Western banded gecko	Western threadsnake (blindsnake)
Zebra-tailed lizard		
Terrestrial Invertebrates		
Great Basin small blue (small blue) butterfly	Mojave gypsum bee	Mojave poppy bee
Mono Basin skipper (Railroad Valley skipper) butterfly	Northern Mojave blue (Mojave blue) butterfly	

3.8.5.3 Alternate Southern Terminal

The Alternate Southern Terminal is sited within the same vegetation communities as the Proposed Alternative Southern Terminal. Special status wildlife species that could potentially occur at this terminal would be the same as presented in **Table 3.8-9**.

3.8.5.4 Southern Terminal Located Near IPP (Design Option 2)

Vegetative communities located within the Southern Terminal located near IPP (Design Option 2) siting area include, grassland, greasewood flat, herbaceous wetland, and saltbush shrubland. Direct impacts resulting from the construction of the terminal and associated facilities could occur within grassland, saltbush shrubland, and greasewood flat vegetative communities only.

Table 3.8-10 presents special status wildlife species potentially occurring at the Southern Terminal located near IPP (Design Option 2).

Table 3.8-10 Special Status Wildlife Species Potentially Occurring at the Southern Terminal Located near IPP (Design Option 2)

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Fringed myotis	Hoary bat	Long-eared myotis
Long-legged myotis	Pallid bat	Silver-haired bat

Table 3.8-10 Special Status Wildlife Species Potentially Occurring at the Southern Terminal Located near IPP (Design Option 2)

Spotted bat	Townsend's (Western) big-eared bat	Western pipistrelle
Western red bat	Western small-footed myotis	Yuma myotis
Mammals - Other		
Dark kangaroo mouse	Desert Valley kangaroo mouse	Kit fox
White-tailed prairie dog		
Birds		
Least bittern	White-faced ibis	Swainson's hawk
Ferruginous hawk	Golden eagle	Peregrine falcon
Prairie falcon	Columbian sharp-tailed grouse	Mountain plover
Long-billed curlew	Black tern	Burrowing owl
Long-eared owl	Short-eared owl	Black swift
Loggerhead shrike	Crissal thrasher	Gray vireo
Vesper sparrow	Bobolink	
Reptiles		
Banded Gila monster	Corn snake	Desert iguana
Long-nosed leopard lizard	Midget faded rattlesnake	Smooth greensnake
Speckled rattlesnake	Utah milk snake	Western banded gecko
Western threadsnake (blindsnake)		
Terrestrial Invertebrates		
Eureka mountainsnail	Great Basin silverspot (Nokomis fritillary) butterfly	Grey's silverspot (Grey's fritillary) butterfly
Honey Lake blue butterfly	MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	Mono Basin skipper (Railroad Valley skipper) butterfly
Rice's blue butterfly	White River wood nymph butterfly	

3.8.5.5 Southern Substation located near IPP (Design Option 3)

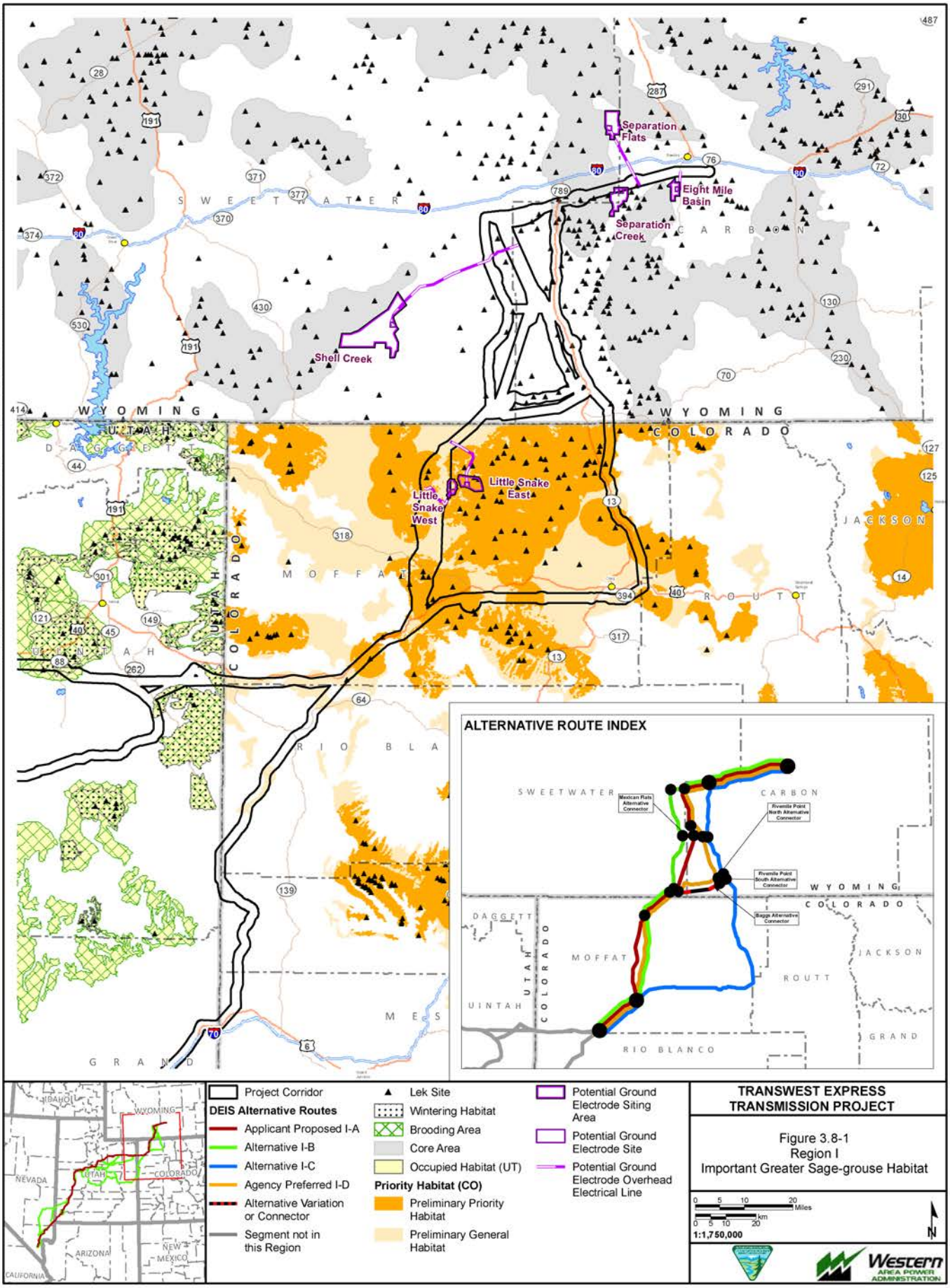
The Southern Substation located near IPP (Design Option 3) would be sited entirely within the boundaries of the Southern Terminal (Design Option 2). Special status wildlife species that could potentially occur at this terminal would be the same as presented in **Table 3.8-10**.

3.8.5.6 Region I

Region I extends from the Northern Terminal siting area near Rawlins, Wyoming, southwest through northeastern Utah and northwestern Colorado. Dominant vegetation community types are sagebrush shrubland and saltbush shrubland. All vegetation communities except deciduous forest, desert shrub, and riparian occur in Region I. A description of vegetation communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region I are presented in **Table 3.8-11**. Habitat within the greater sage-grouse analysis area in Region I is presented in **Figure 3.8-1**. Black-footed ferret non block-cleared areas and white-tailed prairie dog colonies within the black-footed ferret analysis area in Wyoming are presented in **Figure 3.8-2**.

Table 3.8-11 Special Status Wildlife Species Potentially Occurring in Region I

Mammals – Bats		
Big brown bat	California myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western pipistrelle	Western red bat	Western small-footed myotis
Yuma myotis		
Mammals – Other		
Black-footed ferret	Canada lynx	Wyoming pocket gopher
Fisher	Gray wolf	Idaho pocket gopher
Pygmy rabbit	River otter	Rocky Mountain bighorn sheep
Swift fox	White-tailed prairie dog	Wolverine
Birds		
American white pelican	Least bittern	White-faced ibis
Trumpeter swan	Barrow's goldeneye	Bald eagle
Northern goshawk	Swainson's hawk	Ferruginous hawk
Golden eagle	Peregrine falcon	Prairie falcon
Greater sage-grouse	Columbian sharp-tailed grouse	Mountain plover
Long-billed curlew	Black tern	Western yellow-billed cuckoo
Flammulated owl	Burrowing owl	Long-eared owl
Short-eared owl	Boreal owl	Black swift
Lewis' woodpecker	Red-naped sapsucker	American three-toed woodpecker
Loggerhead shrike	Gray vireo	Pinyon jay
Juniper titmouse	Sage thrasher	Yellow-breasted chat
Brewer's sparrow	Vesper sparrow	Sage sparrow
Grasshopper sparrow	Bobolink	
Reptiles		
Corn Snake	Long-nosed leopard lizard	Midget faded rattlesnake
Smooth greensnake		
Terrestrial Invertebrates		
Great Basin silverspot (Nokomis fritillary butterfly)		


Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake West
Little Snake East
SWEETWATER
CARBON
WYOMING
COLORADO
UTAH
DAGGETT
MOFFAT
ROUTT
JACKSON
RIO BLANCO
GRAND
ALTERNATIVE ROUTE INDEX
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Lek Site
Wintering Habitat
Brooding Area
Core Area
Occupied Habitat (UT)
Priority Habitat (CO)
Preliminary Priority Habitat
Preliminary General Habitat
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.8-1
Region I
Important Greater Sage-grouse Habitat
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Western AREA POWER ADMINISTRATION
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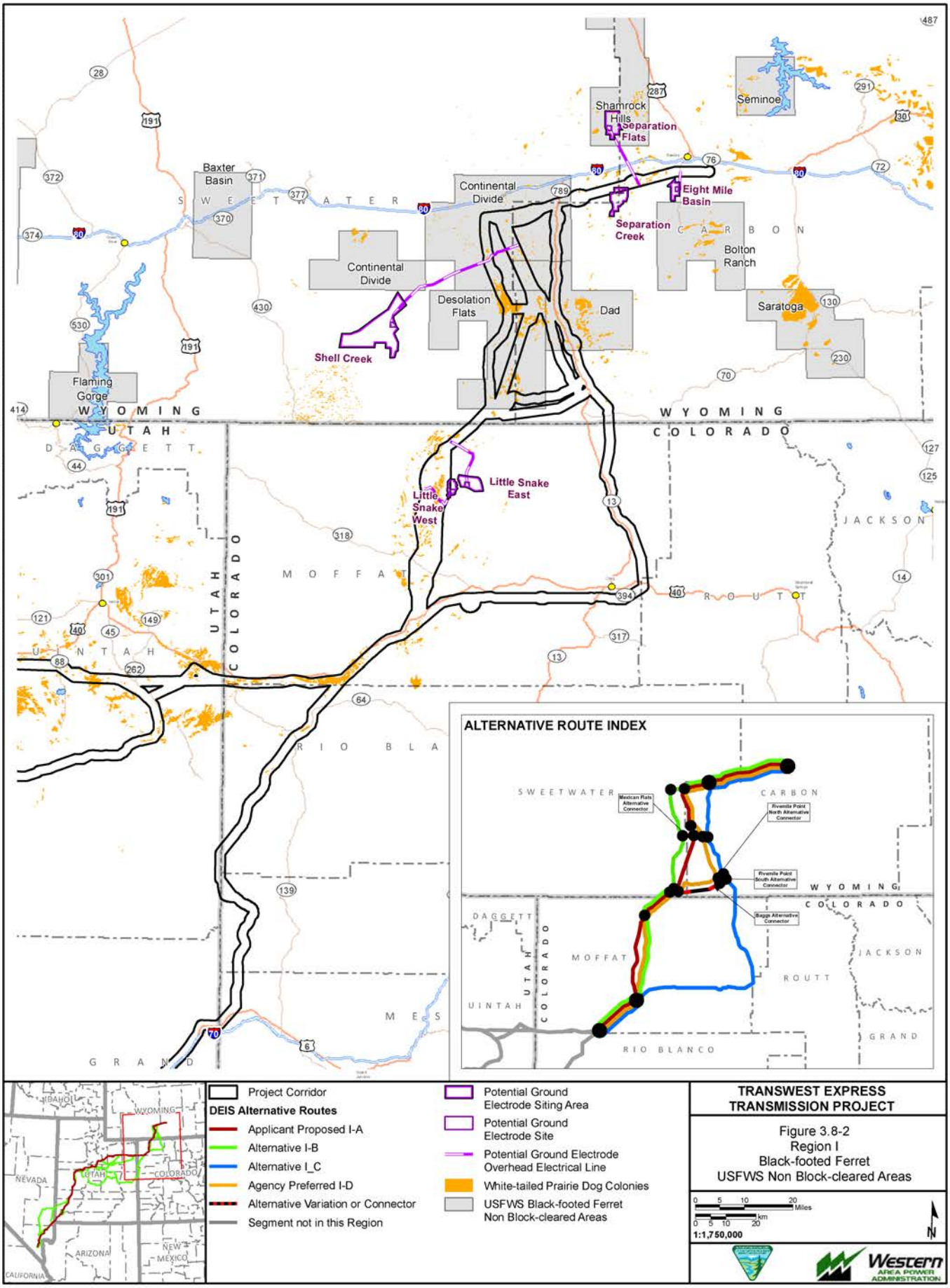
Shamrock Hills
Separation Flats
Seminoe
Baxter Basin
Continental Divide
Eight Mile Basin
Separation Creek
Bolton Ranch
Continental Divide
Desolation Flats
Dad
Saratoga
Shell Creek
Flaming Gorge
WYOMING
UTAH
COLORADO
Little Snake East
Little Snake West
JACKSON
MOFFAT
ROUTT
UINTAH
RIO BLANCO
GRAND
ALTERNATIVE ROUTE INDEX
SWEETWATER
CARBON
Mexican Flats Alternative Connector
Riverside Point North Alternative Connector
Riverside Point South Alternative Connector
Bagge Alternative Connector
DAGGETT
MOFFAT
ROUTT
JACKSON
UINTAH
RIO BLANCO
GRAND
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I_C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
White-tailed Prairie Dog Colonies
USFWS Black-footed Ferret Non Block-cleared Areas
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.8-2
Region I
Black-footed Ferret
USFWS Non Block-cleared Areas
0 5 10 20 Miles
0 5 10 20 km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
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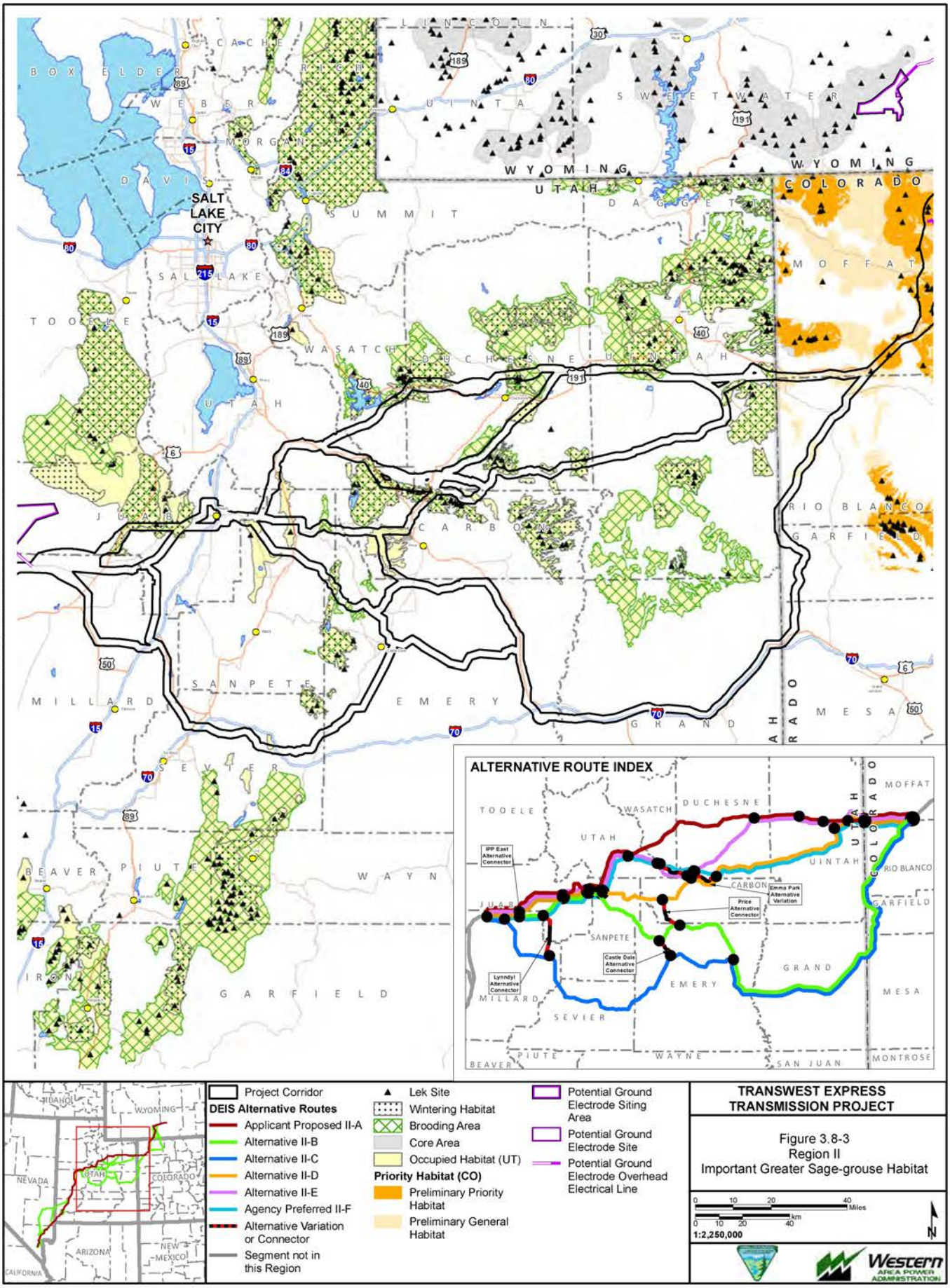
3.8.5.7 Region II

Region II extends from northeastern Utah and northwestern Colorado to the IPP in western Utah. Vegetation in Region II is diverse, with the dominant community types consisting of sagebrush shrubland, saltbush shrubland, and pinyon-juniper. All other vegetation communities also occur in Region II. A description of vegetation communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region II are presented in **Table 3.8-12**. Habitat within the greater sage-grouse analysis area in Region II is presented in **Figure 3.8-3**. Miles of national forest crossed by region by alternative, alternative connector, or variation is presented in **Table 3.7-27** in Section 3.7, Wildlife.

Table 3.8-12 Special Status Wildlife Species Potentially Occurring in Region II

Mammals - Bats		
Big brown bat	Big free-tailed bat	Brazilian free-tailed bat
California myotis	Fringed myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western pipistrelle	Western red bat	Western small-footed myotis
Yuma myotis		
Mammals - Other		
Black-footed ferret	Canada lynx	Dark kangaroo mouse
Desert bighorn sheep	Fisher	Gray wolf
Kit fox	Pygmy rabbit	River otter
Rocky Mountain bighorn sheep	Utah prairie dog	White-tailed prairie dog
Wolverine		
Birds		
American white pelican	White-faced ibis	Bald eagle
Northern goshawk	Swainson's hawk	Ferruginous hawk
Golden eagle	Peregrine falcon	Prairie falcon
Greater sage-grouse	Columbian sharp-tailed grouse	Mountain plover
Long-billed curlew	Black tern	Yellow-billed cuckoo (western)
Flammulated owl	Burrowing owl	Mexican spotted owl
Long-eared owl	Short-eared owl	Boreal owl
Black swift	Lewis's woodpecker	Red-naped sapsucker
American three-toed woodpecker	Loggerhead shrike	Gray vireo
Pinyon jay	Juniper titmouse	Sage thrasher
Bendire's thrasher	Yellow-breasted chat	Brewer's sparrow
Vesper sparrow	Sage sparrow	Bobolink
Reptiles		
Corn snake	Long-nosed leopard lizard	Midget faded rattlesnake
Smooth greensnake	Utah milk snake	
Terrestrial Invertebrates		
Eureka mountainsnail	Great Basin silverspot butterfly (Nokomis fritillary butterfly)	



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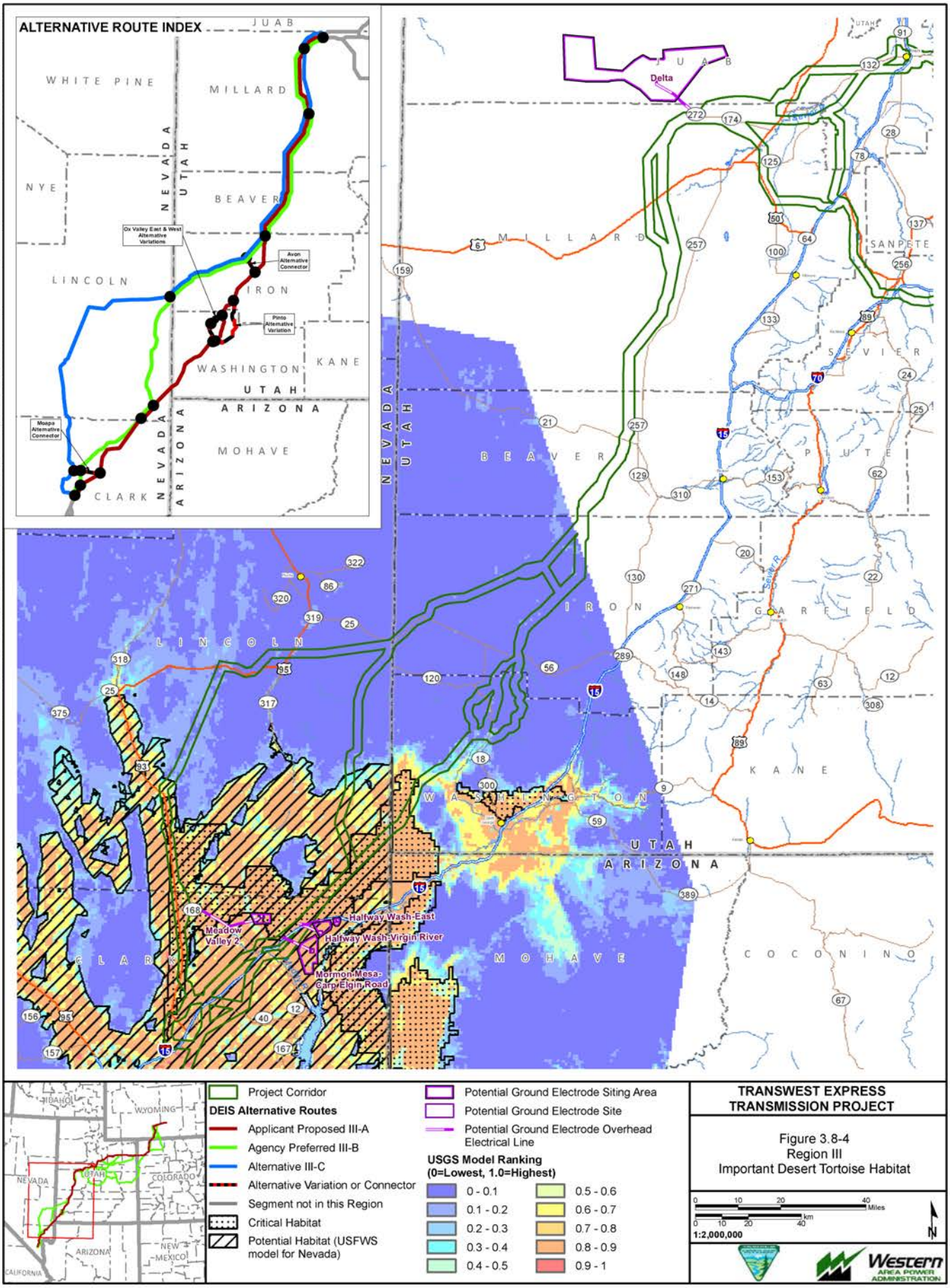
3.8.5.8 Region III

Region III extends from the IPP in western Utah to northern Las Vegas, Nevada. In Region III, desert shrubland is the dominant community. All other vegetation communities occur in Region III. A description of vegetation communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region III are presented in **Table 3.8-13**. Habitat within the desert tortoise analysis area in Region III is presented in **Figure 3.8-4**. Habitat within the greater sage-grouse analysis area in Region III is presented in **Figure 3.8-5**. The Dixie National Forest is crossed by the Project in Region III. **Table 3.7-27** presents the Region III alternatives and project components that occur in or cross the Dixie National Forest.

Table 3.8-13 Special Status Wildlife Species Potentially Occurring in Region III

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Cave myotis	Fringed myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western pipistrelle	Western red bat	Western small-footed myotis
Yuma myotis		
Mammals - Other		
Dark kangaroo mouse	Desert bighorn sheep	Desert Valley kangaroo mouse
Kit fox	Pygmy rabbit	Rocky Mountain bighorn sheep
Utah prairie dog		
Birds		
Least bittern	White-faced ibis	California condor
Bald eagle	Swainson's hawk	Ferruginous hawk
Golden eagle	Peregrine falcon	Prairie falcon
Greater sage-grouse	Yuma clapper rail	Long-billed curlew
Yellow-billed cuckoo (western)	Burrowing owl	Mexican spotted owl
Long-eared owl	Short-eared owl	Lewis's woodpecker
Red-naped sapsucker	Southwestern willow flycatcher	Loggerhead shrike
Gray vireo	Pinyon jay	Sage thrasher
Bendire's thrasher	Crissal thrasher	Le Conte's thrasher
Phainopepla	Lucy's warbler	Yellow-breasted chat
Brewer's sparrow	Vesper sparrow	Sage sparrow
Bobolink		
Reptiles		
Banded Gila monster	Chuckwalla	Corn snake
Desert iguana	Desert night lizard	Desert tortoise
Long-nosed leopard lizard	Mojave rattlesnake	Sidewinder
Speckled rattlesnake	Western banded gecko	Western red-tailed skink
Western threadsnake (blindsnake)	Zebra-tailed lizard	
Terrestrial Invertebrates		
Great Basin small blue (Small blue) butterfly	Grey's silverspot (Grey's fritillary) butterfly	Honey Lake blue butterfly
MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	Mojave gypsum bee	Mojave poppy bee
Mono Basin skipper (Railroad Valley skipper) butterfly	Northern Mojave blue (Mojave blue) butterfly	Rice's blue butterfly
White River wood nymph butterfly		


ALTERNATIVE ROUTE INDEX
JUAB
WHITE PINE
MILLARD
NYE
NEVADA
UTAH
BEAVER
Ox Valley East & West Alternative Variations
Avon Alternative Connector
LINCOLN
IRON
Pinto Alternative Variation
WASHINGTON
KANE
UTAH
ARIZONA
Moapa Alternative Connector
MOHAVE
CLARK
Delta
SANPETE
SEVIER
PIUTE
GARFIELD
Halfway Wash-East
Halfway Wash-Virgin River
Meadow Valley 2
Mormon Mesa-Carp Elgin Road
COCONINO
Project Corridor
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Critical Habitat
Potential Habitat (USFWS model for Nevada)
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
USGS Model Ranking (0=Lowest, 1.0=Highest)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.8-4
Region III
Important Desert Tortoise Habitat
1:2,000,000
Western AREA POWER ADMINISTRATION
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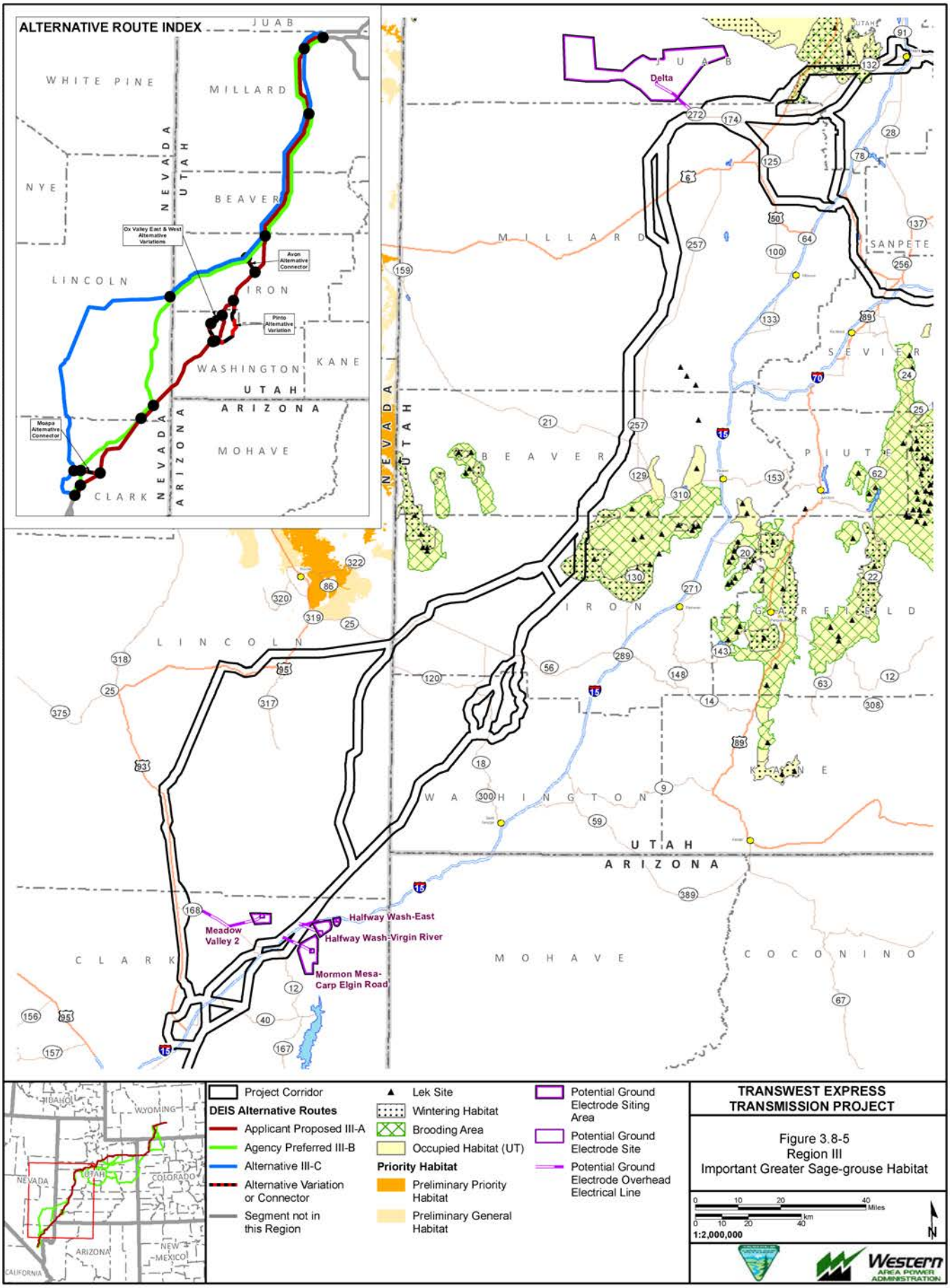
ALTERNATIVE ROUTE INDEX
WHITE PINE
MILLARD
NYE
BEAVER
LINCOLN
IRON
WASHINGTON
KANE
UTAH
ARIZONA
MOHAVE
CLARK
NEVADA
Ox Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
Delta
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
COCONINO
SANPETE
SEVIER
PIUTE
GARFIELD
Project Corridor
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Lek Site
Wintering Habitat
Brooding Area
Occupied Habitat (UT)
Priority Habitat
Preliminary Priority Habitat
Preliminary General Habitat
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.8-5
Region III
Important Greater Sage-grouse Habitat
1:2,000,000
Western AREA POWER ADMINISTRATION
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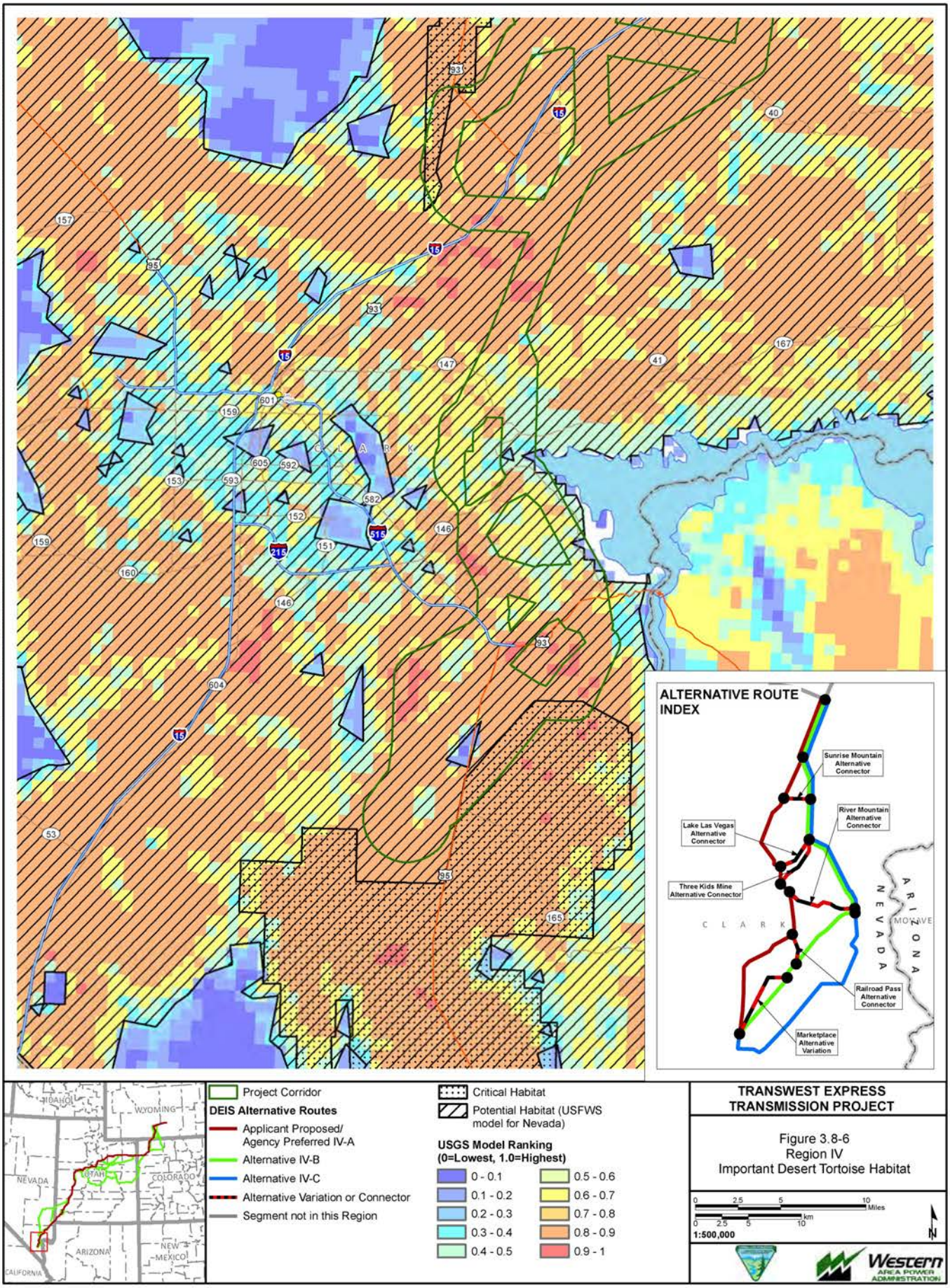
3.8.5.9 Region IV

Region IV extends from northern Las Vegas, Nevada to Marketplace, Nevada. There is less diversity of vegetation communities in Region IV. The dominant community type is desert shrubland. The remaining vegetation communities include: barren/sparsely vegetated; cliff and canyon; desert shrub; grassland; herbaceous wetland; open water; pinyon-juniper; riparian; sagebrush shrubland; saltbush shrubland; and woody riparian and wetlands. A description of these communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region IV are presented in **Table 3.8-14**. Habitat within the desert tortoise analysis area in Region IV is presented in **Figure 3.8-6**.

Table 3.8-14 Special Status Wildlife Species Potentially Occurring in Region IV

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Cave myotis	Fringed myotis	Greater western mastiff bat
Hoary bat	Long-eared myotis	Long-legged myotis
Pallid bat	Silver-haired bat	Spotted bat
Townsend's (Western) big-eared bat	Western pipistrelle	Western red bat
Western small-footed myotis	Yuma myotis	
Mammals - Other		
Dark kangaroo mouse	Desert bighorn sheep	Kit fox
Pale kangaroo mouse		
Birds		
Least bittern	White-faced ibis	Bald eagle
Swainson's hawk	Ferruginous hawk	Golden eagle
Peregrine falcon	Prairie falcon	Yuma clapper rail
Western snowy plover	Yellow-billed cuckoo (western)	Burrowing owl
Long-eared owl	Red-naped sapsucker	Southwestern willow flycatcher
Loggerhead shrike	Gray vireo	Bendire's thrasher
Crissal thrasher	Le Conte's thrasher	Phainopepla
Lucy's warbler	Yellow-breasted chat	
Reptiles		
Banded Gila monster	Chuckwalla	Desert glossy snake
Desert iguana	Desert night lizard	Desert tortoise
Long-nosed leopard lizard	Mojave rattlesnake	Mojave shovel-nosed snake
Sidewinder	Speckled rattlesnake	Western banded gecko
Western red-tailed skink	Western threadsnake (blindsnake)	Zebra-tailed lizard
Terrestrial Invertebrates		
Great Basin small blue (small blue) butterfly	Honey Lake blue butterfly	Mojave gypsum bee
Mojave poppy bee	Mono Basin skipper (Railroad Valley skipper) butterfly	Northern Mojave blue (Mojave blue) butterfly
Rice's blue butterfly		



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3.8.6 Impacts to Special Status Wildlife Species

The impact assessment analysis area for special status wildlife species includes habitats within a 250-foot-wide transmission line ROW for each alternative route. The impact analysis area for potential access roads includes habitats that occur within a 2-mile transmission line corridor for each alternative route. This analysis area was assessed because the exact locations of access roads have not been determined. Identification of habitat potentially impacted by Project activities focused on vegetation communities that support various special status wildlife species seasonally or throughout the year.

Several small reroutes and micro-siting adjustments to the proposed alternative routes in Regions II and III have been included in analyses and are described in detail in Section 2.5.1. These adjustments would occur along Alternatives I-D, II-A, II-B, II-C, II-E, II-F, III-A, IV-A, and IV-C. Alternatives I-B and I-D have been widened slightly to accommodate possible micro-siting adjustments to avoid greater sage-grouse habitat. The slight changes in impact acreages for micro-siting, widening, reroutes, or merged alternative segments will be included in analyses, but are not expected to cause more than incremental differences in impacts to special status species. These project adjustments have been incorporated to address concerns regarding USFS IRAs, BLM designated utility corridors, and greater sage-grouse potential habitat.

The methodology for evaluating impacts to special status wildlife species focused on those species that were identified as potentially occurring within the special status wildlife analysis area. Species considered for the impact analysis are included in **Table 3.8-6**. Special status wildlife species included in this analysis include 38 mammals, 51 birds, 19 reptiles, and 12 terrestrial invertebrate species. In total, 4 federally listed mammals, 7 bird species, and 1 reptile species were analyzed. Two federal candidate species were analyzed, along with 106 BLM, USFS, and/or state-protected species. Three federally listed bird species do not occur in the special status wildlife analysis area, but are included on the special status species lists due to their occurrence in the North Platte sub-basin.

Special status wildlife species-related issues addressed by this impact assessment were determined through the public scoping process and in consultation with BLM, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. Issues ranged from direct loss and fragmentation of desert tortoise habitat and greater sage-grouse habitat, to the direct loss of birds, primarily greater sage-grouse and raptor species, as a result of electrocution and collision with transmission lines. Impact parameters were used in combination to quantify impacts. The impact parameters also allow comparisons among the applicant-proposed routes, alternatives, and alternative variations. Impact issues and the analysis considerations for special status wildlife species are listed in **Table 3.8-15**.

Table 3.8-15 Relevant Analysis Considerations for Special Status Wildlife Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Habitat loss and fragmentation	• Acres of habitat for wildlife species located within the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for access roads are quantified; • Species-specific avoidance measures are discussed; • The degree to which the loss or fragmentation of habitat would affect individuals and whether these effects could impact populations of affected species are qualitatively discussed; • Changes in vegetation communities that influence wildlife habitat are referenced; • The timeline for vegetation communities to recover to baseline levels is estimated; • Habitat disturbance is related to overall habitat availability in the respective analysis areas; and • Impacts resulting from habitat loss and fragmentation are evaulated using the best available literature.

Table 3.8-15 Relevant Analysis Considerations for Special Status Wildlife Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Loss of or injury to a species, displacement of individuals, and loss of breeding success from exposure to increased noise and human activity	• Impacts of bird and bat collisions from transmission lines on overall populations are evaluated in qualitative terms; • A qualitative discussion of how construction and operation activities may displace or impact breeding activity for wildlife species is included; and • The wildlife/vehicle collision potential is described in both quantitative and qualitative terms.
Potential impacts of increased perches/predation from Project infrastructure	• Impacts of increased predation by raptors and corvids (e.g., ravens, crows) on wildlife species is evaluated in qualitative terms.

Potential direct and indirect effects of construction, operation, and decommissioning on special status wildlife species and their associated habitats are discussed below. After impacts are identified, relevant BMPs and TWE's design features are discussed in terms of reducing impacts. If impacts remain after application of BMPs and TWE's design features, additional mitigation is recommended to reduce impacts. As required under Section 7 of the Endangered Species Act, a BA will be prepared for the TransWest Express Transmission Project (Draft EIS) to determine whether the proposed Project is likely to affect any federally listed, candidate, or proposed species.

The impacts analysis for special status wildlife species assumes that the BLM and USFS will continue to manage special status wildlife species habitats in coordination with CPW, NDOW, UDWR, and WGFD and that the USFWS has jurisdiction over the management of federally endangered, threatened, and proposed species populations. It also assumes that the BLM will continue to manage BLM sensitive species in accordance with BLM Manual 6840 and the USFS will continue to manage MIS and their habitats in accordance with NFMA and Forest Plan requirements and USFS sensitive species in accordance with U.S. Forest Service Manual 2670. Further assumptions are that the design features committed to by TWE and the BMPs would be implemented under all alternatives (**Appendix C**).

Through the implementation of the following Project design features and BMPs (as outlined in **Appendix C**), the direct impacts to special status wildlife resources due to construction would be minimized:

- WWEC BMPs – ECO-1/ECO-2/ECO-4/ECO-6/ECO-7/ECO-8 (protection of sensitive wildlife and habitats); FIRE-1/FIRE-2 (fire management and fuels strategies); NOISE-2 (noise reduction strategy); REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours) and REST-2 (restoring vegetation to values commensurate with the ecological setting);
- Agency BMPs – All applicable State and Federal agency No Surface Occupancy restrictions (NSO), Conditional Surface Occupancy (CSO) restrictions, and Timing Limitations (TL) as outlined in Appendix C;
- TWE Design Features – TWE-1/TWE-2 (compliance with agency stipulations, laws and regulations); TWE-4 (environmental training); TWE-13/TWE-14/TWE-16 (vegetation management, restoration, and erosion control); TWE-26/TWE-27/TWE-28 (vegetation and noxious weed management); TWE-29/TWE-30/TWE-31/TWE-32/TWE-33/TWE-34 (ecological and special status species protection).

In addition the following mitigation measure for wildlife should be implemented:

- ***SSWS-1**: In order to protect nesting mountain plovers, TWE would follow the USFWS 2002 Mountain Plover Survey Guidelines and would conduct mountain plover nest surveys if construction were to occur during the mountain plover breeding season (April 10 to July 10). If a nest is located, a 0.25 mile protection buffer would be implemented around the active nest until the birds fledge from the nest.*
- ***SSWS-2**: Prior to construction activities in suitable pygmy rabbit habitat, TWE would conduct presence/absence surveys following appropriate protocols. Areas within 0.5 mile of proposed disturbance that show characteristics of pygmy rabbit habitat will be surveyed in accordance with the Interagency Pygmy Rabbit Working Group Survey Protocols (Ulmschneider et al. 2004). If the surveys conclude that pygmy rabbits occur, the "Habitat Preservation and Restoration" conservation measures would apply (Keinath and McGee 2004).*
- ***SSWS-3**: Prior to construction activities in suitable Wyoming pocket gopher habitat, TWE would conduct presence/absence surveys following appropriate protocols. If active pocket gopher mounds are identified, the proposed surface disturbing activities would avoid the active pocket gopher mounds by 75 m (BLM 2009). However, if TWE does not wish to avoid the active pocket gopher mounds by 75 m, classification surveys (via live capture) must be completed to identify the pocket gopher responsible for the mounds to the species level. If the results conclude that the Wyoming pocket gopher is responsible for the mounds, the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" would apply (BLM 2009). If the results conclude that the associated species is a northern pocket gopher, then the proposed surface disturbance may proceed without mitigation. If the classification survey fails to conclusively identify the associated pocket gopher to the species level, then it will be assumed that the species is a Wyoming pocket gopher and the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" will apply (BLM 2009).*
- ***SSWS-4**: To avoid and minimize impacts to the desert tortoise and its habitat, TWE would conduct field surveys in identified desert tortoise habitat following approved USFWS protocols. TWE would coordinate with the BLM, Western, Boulder City, Clark County, Nevada, Bureau of Reclamation, and USFWS to implement appropriate mitigation measures during construction, including but not limited to, fencing, preconstruction surveys, and relocating desert tortoises.*
- ***SSWS-5**: To reduce impacts to greater sage-grouse from operation of the proposed Project, several specific design features would be implemented.*
  - *To limit raptor and corvid predation on greater sage-grouse, TWE would be required to construct anti-perching devices on segments of the proposed Project near high quality greater sage-grouse habitat (e.g., within 4 miles of occupied/active leks, within core areas, within PPH, etc.) in consultation with the BLM, Western, and applicable state wildlife agencies.*
  - *To limit the potential for greater sage-grouse collisions with guy wires, TWE would be required to outfit guy wires with agency approved bird diverters within high quality greater sage-grouse habitat, or alternatively, to construct alternative structures such as self-supporting steel lattice structures or self-supporting tubular H-frame structures instead of guyed lattice structures within greater sage-grouse habitat.*
- ***SSWS-6**: To prevent impacts to the western yellow-billed cuckoo during the breeding season, TWE would avoid construction within potentially suitable habitat from March 15 to October 15, or, alternatively, would conduct breeding western yellow-billed cuckoo surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*
- ***SSWS-7**: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as*

reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.

- ***SSWS-8**: To prevent impacts to southwestern willow flycatchers during the breeding season, TWE would avoid construction within suitable habitat from March 15 to October 15, or, alternatively, conduct breeding southwestern willow flycatcher surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*
- ***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented. To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

3.8.6.1 Impacts from Terminal Construction and Operation

Section 2.4, Elements Common to All Action Alternatives describes the Northern Terminal, the Proposed Alternative Southern Terminal, the Southern Terminal located near IPP (Design Option 2), and the Southern Substation located near IPP (Design Option 3). Vegetative communities potentially impacted at terminal siting areas are presented below. No national forests would be impacted by terminals.

Potential impacts to special status wildlife species at terminal sites can be grouped into two main categories: construction and operation. Construction-related impacts primarily are habitat disturbance, fragmentation, and direct mortalities as a result of vehicle collisions and crushing of nests/burrows. Habitat disturbance resulting from the construction of terminals can be further classified into construction and operation impacts. Construction impacts account for all disturbance during construction of the terminal sites. Operation impacts are defined as impacts that remain after construction reclamation efforts are complete and will last at least as long as the Project is in operation. Examples of operation impacts include habitat disturbance in areas where facilities will be sited that wouldn't be reclaimed until after the end of the Project's design life (decommissioning). Habitat impacts can be further categorized as direct and indirect. Direct habitat impact results when habitat is destroyed or converted to a form that is unsuitable for the impacted species. The primary potential indirect impact is species avoidance (displacement) of otherwise suitable habitat in and around terminal locations. The methodology for calculating indirect impacts to habitat is described in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components.

The primary operation-related impact associated with the terminals is mortality as a consequence of electrocution or collision with transmission line components.

<u>Raptor Nest Data Assumptions</u>

Raptor species are known to use nests for multiple years. The species using a particular nest may vary annually. For example, owls do not construct their own nests; they use previously constructed nests, or even burrows. Non-raptor species also use raptor nests and vice versa. Common ravens are not considered raptors, but raptor nest data often include common raven nests, for this reason.

When a raptor nest is identified outside of nesting season, or when no birds are present, it is often not possible to determine the species using the nest. Such nest occurrence data is still valuable and is included in analyses as unknown. Also, as previously described, the species using a nest can change over time. Nests for which the species is unknown are reported both in Section 3.7, Wildlife and Section 3.8, Special Status Wildlife Species.

Raptor nest data are compiled from seven BLM Field Offices, four National Forest datasets, NDOW, and two consultants. Every effort was made to compile the most accurate dataset for the project; however,

there is potential for duplication. The EIS analysis reports nests within 1 mile of the project reference lines and terminal sites. It is possible for a particular raptor nest to occur within 1 mile of multiple alternative routes, micro-siting options, alternative connectors, alternative variations, electrode sites, and terminal sites. Thus, the nest would be reported as potentially impacted multiple times.

Finally, while the most recent raptor nest data has been incorporated into analyses, nests and nest structures (i.e. trees) can be destroyed and new nests are constructed each year. A comprehensive raptor nest survey would be conducted along the agency preferred route prior to construction. This would provide the data needed to inform micro-siting adjustments, to avoid or minimize impacts to nesting raptors.

Construction Impacts

Northern Terminal

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted by construction and operation of the Northern Terminal include five federally listed; two federal candidate; and 45 BLM sensitive, USFS sensitive, and state-protected species. Suitable habitat for the western yellow-billed cuckoo and Canada lynx does not occur at the Northern Terminal; therefore, impacts to those species are not anticipated. Section 3.7.6.1 presents a description of existing disturbance at the Northern Terminal siting area.

Construction of the Northern Terminal would result in the construction and operation disturbance of 488 acres and 203 acres, respectively. These areas represent <0.01 percent of shrubland habitat within the Region I special status wildlife analysis area. The remaining disturbance area would be reclaimed at the end of the life of the Project (estimated at 50 years). Impacts to special status wildlife species that may be found at the Northern Terminal are presented below.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

These species occur downstream of the Region I special status wildlife analysis area, along the Platte River in Nebraska. This area is located a considerable distance downstream of any construction or operation disturbance areas in Wyoming; thus, these activities would not affect the whooping crane, interior least tern, or piping plover. However, water depletion also must be evaluated for these species based on the Platte River Recovery Implementation Program (PRRIP), which was implemented in 2006. The goal of the PRRIP is to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska. Platte River water depletions include evaporative losses and consumptive use, which is characterized as diversions from the Platte River or its tributaries, less return flows. Any actions that may result in depletion to the Platte River system should be identified, and the amount and timing of the depletion calculated and provided to the USFWS. Since 1978, USFWS has concluded in all of its ESA Section 7 consultations on water projects in the Platte River basin in Nebraska that the Platte River ecosystem is in a state of jeopardy, and that any federal action resulting in further water depletion to the Platte River system will further or continue deterioration of the stressed habitats to be resources of national and international importance (USDOS 2008).

TWE has indicated that all water requirements for the Project will be met using existing water rights. Required water will be procured from municipal sources, from commercial sources, or under a temporary water use agreement with landowners holding existing water rights. No new water rights will be required. Therefore, construction of the Northern Terminal is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur.

Greater Sage-grouse (Candidate)

A total of 2 occupied leks occur within 4 miles of the Northern Terminal. Approximately 230 acres of construction impacts and 150 acres of operation impacts would occur to BLM (Rawlins FO) mapped nesting and brood-rearing habitat as a result of the construction and operation of the Northern Terminal. However, due to the proposed location of the Northern Terminal near existing significant human disturbance, it is unlikely that greater sage-grouse typically occupy habitats in this area, especially for lekking. In addition, the Northern Terminal is not located within a greater sage-grouse core area. Nonetheless, potential mortality from construction of the Northern Terminal may occur if greater sage-grouse are present. The risk of direct mortality to greater sage-grouse from construction is most likely limited to nesting hens or young chicks that have limited mobility.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.) and implement seasonal timing restrictions and protection buffers in accordance with BLM IM 2010-012, EO 2011-5, and the BLM Rawlins FO RMP. Adherence to these regulations and guidelines would reduce impacts to greater sage-grouse during construction. In addition, implementation of TWE-26 and **VEG-1** would aid in reclamation activities to restore communities (e.g., sagebrush shrubland) to native ecosystems, especially in areas where reclamation is difficult. Implementation of **NX-1** and **NX-2** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive plant species. Therefore, impacts to greater sage-grouse from the construction and operation of the Northern Terminal would be limited primarily to habitat loss and fragmentation.

Black-footed Ferret (Endangered)

No white-tailed prairie dog colonies occur at the Northern Terminal site. In addition, the USFWS has block-cleared all white-tailed prairie dog colonies in, and around the Northern Terminal location (USFWS 2004). The nearest non block-cleared area for black-footed ferrets is the Bolton Ranch Complex approximately 10 miles south of the Northern Terminal location. The nearest re-introduced population of black-footed ferrets is approximately 65 miles northeast of the Northern Terminal location in the Shirley Basin.

Due to the location of the Northern Terminal outside USFWS non block-cleared areas for black-footed ferrets, there is an extremely low likelihood of black-footed ferrets occurring at the Northern Terminal. No impacts to black-footed ferrets are expected.

BLM Sensitive and State-protected Species

BLM sensitive and state-protected species that may occur at the Northern Terminal are presented in **Table 3.8-16**. The types of direct and indirect impacts of construction and operation of the Northern Terminal to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Northern Terminal are presented in Section 3.5, Vegetation. Two burrowing owl, 5 golden eagle, 1 great horned owl, 1 prairie falcon, and 12 raptor nests for which the species is not known also are documented within 1 mile of the Northern Terminal. Species-specific mitigation measures are discussed below.

SSWS-1*: In order to protect nesting mountain plovers, TWE would follow the USFWS 2002 Mountain Plover Survey Guidelines and would conduct mountain plover nest surveys if construction were to occur during the mountain plover breeding season (April 10 to July 10). If a nest is located, a 0.25 mile protection buffer would be implemented around the active nest until the birds fledge from the nest.*

Table 3.8-16 BLM Sensitive and State-protected Species Potentially Occurring at the Northern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Big brown bat	Grassland, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
California myotis	Greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Grassland, herbaceous wetland, woody riparian and wetlands
Long-eared myotis	Cliff and canyon, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Herbaceous wetland, saltbush shrubland, woody riparian and wetlands
Pallid bat	Grassland, greasewood flat, woody riparian and wetlands
Silver-haired bat	Greasewood flat, herbaceous wetland, woody riparian and wetlands
Spotted bat	Greasewood flat, herbaceous wetland
Townsend's (Western) big-eared bat	Saltbush shrubland, sagebrush shrubland
Western pipistrelle	Herbaceous wetland
Western small-footed myotis	Cliff and canyon, greasewood flat, herbaceous wetland, woody riparian and wetlands
Yuma myotis	Cliff and canyon, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland
Mammals - Other	
Pygmy rabbit	Sagebrush shrubland
River otter	Woody riparian and wetlands
Swift fox	Grassland
White-tailed prairie dog	Grassland, greasewood flat, sagebrush shrubland, saltbush shrubland
Wyoming pocket gopher	Greasewood flat, sagebrush shrubland, saltbush shrubland
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Trumpeter swan	Herbaceous wetland
Barrow's goldeneye	Woody riparian and wetlands
Bald eagle	Woody riparian and wetlands
Swainson's hawk	Grassland, saltbush shrubland, sagebrush shrubland
Ferruginous hawk	Cliff and canyon, grassland, sagebrush shrubland, saltbush shrubland
Golden eagle	Cliff and canyon, grassland, sagebrush shrubland, saltbush shrubland
Mountain plover	Grassland
Long-billed curlew	Grassland, herbaceous wetland
Black tern	Herbaceous wetland
Burrowing owl	Grassland, sagebrush shrubland, saltbush shrubland
Long-eared owl	Woody riparian and wetlands

Table 3.8-16 BLM Sensitive and State-protected Species Potentially Occurring at the Northern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Short-eared owl	Grassland, greasewood flat, herbaceous wetland, sagebrush shrubland
Loggerhead shrike	Grassland, greasewood flat, saltbush shrubland, sagebrush shrubland
Sage thrasher	Sagebrush shrubland
Yellow-breasted chat	Woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Grasshopper sparrow	Grassland, sagebrush shrubland
Bobolink	Grassland, herbaceous wetland
Reptiles	
Corn snake	Grassland, greasewood flat, herbaceous wetland, woody riparian and wetlands
Long-nosed leopard lizard	Greasewood flat, sagebrush shrubland, saltbush shrubland,
Midget faded rattlesnake	Greasewood flat, sagebrush shrubland, saltbush shrubland
Smooth greensnake	Grassland, greasewood flat, herbaceous wetland, woody riparian and wetlands

Effectiveness: Mitigation measure **SSWS-1** requires TWE to avoid mountain plover nest sites identified within the areas of disturbance to prevent their removal and adhere to seasonal timing restrictions (April 10 to July 10) within applicable protection buffers (0.25 mile). As a result of this mitigation measure, project-related impacts to mountain plovers would not be anticipated and no take is expected as a result of the proposed Project.

SSWS-2*: Prior to construction activities in suitable pygmy rabbit habitat, TWE would conduct presence/absence surveys following appropriate protocols. Areas within 0.5 mile of proposed disturbance that show characteristics of pygmy rabbit habitat will be surveyed in accordance with the Interagency Pygmy Rabbit Working Group Survey Protocols (Ulmschneider et al. 2004). If the surveys conclude that pygmy rabbits occur, the "Habitat Preservation and Restoration" conservation measures would apply (Keinath and McGee 2004).*

Effectiveness: Implementation of **SSWS-2** would be effective in reducing impacts to pygmy rabbits by limiting surface disturbance activities in suitable habitat and by implementing specific protection measures to protect individuals in occupied habitat.

SSWS-3*: Prior to construction activities in suitable Wyoming pocket gopher habitat, TWE would conduct presence/absence surveys following appropriate protocols. If active pocket gopher mounds are identified, the proposed surface disturbing activities would avoid the active pocket gopher mounds by 75 m (BLM 2009). However, if TWE does not wish to avoid the active pocket gopher mounds by 75 m, classification surveys (via live capture) must be completed to identify the pocket gopher responsible for the mounds to the species level. If the results conclude that the Wyoming pocket gopher is responsible for the mounds, the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" would apply (BLM 2009). If the results conclude that the associated species is a northern pocket gopher, then the proposed surface disturbance may proceed without mitigation. If the classification survey fails to conclusively identify the*

associated pocket gopher to the species level, then it will be assumed that the species is a Wyoming pocket gopher and the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" will apply (BLM 2009).

Effectiveness: Implementation of SSW-3 would be effective in reducing impacts to Wyoming pocket gophers by limiting surface disturbance activities in suitable habitat and by implementing specific protection measures to protect individuals in occupied habitat.

Implementation of **SSWS-2** and **SSWS-3** would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures, based on survey results. Additionally, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status wildlife species. Remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species within the Region I special status wildlife analysis area, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact, given the extent of native habitats in the surrounding Project region.

Proposed Alternative Southern Terminal

BLM sensitive and state-protected species that may occur at the proposed alternative Southern Terminal are presented in **Table 3.8-17**. The types of direct and indirect impacts of construction and operation of the proposed alternative Southern Terminal to the 54 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the proposed alternative Southern Terminal are presented in Section 3.5, Vegetation. No special status raptor nests are documented within the proposed alternative Southern Terminal siting area. Species-specific mitigation measures are discussed below. Section 3.7.6.1 presents a description of existing disturbance at the Proposed Alternate Southern Terminal siting area.

Table 3.8-17 BLM Sensitive and State-protected Species Potentially Occurring at the Proposed Alternative Southern Terminal and the Alternate Southern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Allen's big-eared bat	Desert shrubland
Big brown bat	Desert shrubland
Big free-tailed bat	Desert shrubland
Brazilian free-tailed bat	Desert shrubland
California leaf-nosed bat	Desert shrubland
California myotis	Desert shrubland
Cave myotis	Desert shrubland
Fringed myotis	Desert shrubland
Greater western mastiff bat	Desert shrubland
Hoary bat	Desert shrubland
Long-eared myotis	Desert shrubland
Long-legged myotis	Desert shrubland
Pallid bat	Desert shrubland
Silver-haired bat	Desert shrubland
Spotted bat	Desert shrubland

Table 3.8-17 BLM Sensitive and State-protected Species Potentially Occurring at the Proposed Alternative Southern Terminal and the Alternate Southern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Townsend's (Western) big-eared bat	Desert shrubland
Western pipistrelle	Desert shrubland
Western red bat	Desert shrubland
Western small-footed myotis	Desert shrubland
Yuma myotis	Desert shrubland
Mammals - Other	
Dark kangaroo mouse	Desert shrubland
Desert bighorn sheep	Desert shrubland
Kit fox	Desert shrubland
Pale kangaroo mouse	Desert shrubland
Birds	
Swainson's hawk	Desert shrubland
Ferruginous hawk	Desert shrubland
Golden eagle	Desert shrubland
Peregrine falcon	Desert shrubland
Prairie falcon	Desert shrubland
Burrowing owl	Desert shrubland
Long-eared owl	Desert shrubland
Gray vireo	Desert shrubland
Bendire's thrasher	Desert shrubland
Crissal thrasher	Desert shrubland
LeConte's thrasher	Desert shrubland
Phainopepla	Desert shrubland
Reptiles	
Banded Gila monster	Desert shrubland
Chuckwalla	Desert shrubland
Desert glossy snake	Desert shrubland
Desert iguana	Desert shrubland
Desert night lizard	Desert shrubland
Long-nosed leopard lizard	Desert shrubland
Mojave rattlesnake	Desert shrubland
Mojave shovel-nosed snake	Desert shrubland
Sidewinder	Desert shrubland
Speckled rattlesnake	Desert shrubland
Western banded gecko	Desert shrubland
Western threadsnake (blindsnake)	Desert shrubland

Table 3.8-17 BLM Sensitive and State-protected Species Potentially Occurring at the Proposed Alternative Southern Terminal and the Alternate Southern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Zebra-tailed lizard	Desert shrubland
Terrestrial Invertebrates	
Great Basin small blue (Small blue) butterfly	Desert shrubland
Mojave gypsum bee	Desert shrubland
Mojave poppy bee	Desert shrubland
Mono Basin skipper (Railroad Valley skipper) butterfly	Desert shrubland
Northern Mojave blue (Mojave blue) butterfly	Desert shrubland

Alternate Southern Terminal

The Alternate Southern Terminal is sited within the same vegetation communities as the Proposed Alternative Southern Terminal. BLM sensitive and state-protected species that may occur at the Alternate Southern Terminal are presented in **Table 3.8-17**. The types of direct and indirect impacts of construction and operation of the Alternate Southern Terminal to the 54 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Alternate Southern Terminal are presented in Section 3.5, Vegetation. No special status raptor nests are documented within the Alternate Southern Terminal siting area. Species-specific mitigation measures are discussed below. Section 3.7.6.1 presents a description of existing disturbance at the Proposed Alternate Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

BLM sensitive and state-protected species that may occur at the proposed Southern Terminal located near IPP (Design Option 2) are presented in **Table 3.8-18**. The types of direct and indirect impacts of construction and operation of the Southern Terminal located near IPP (Design Option 2) to the 60 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Southern Terminal located near IPP (Design Option 2) are presented in Section 3.5, Vegetation. No special status raptor nests are documented within the Southern Terminal located near IPP (Design Option 2) siting area. Species-specific mitigation measures are discussed below.

Table 3.8-18 BLM Sensitive and State-protected Species Potentially Occurring at the Southern Terminal located near IPP (Design Option 2)

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Allen's big-eared bat	Greasewood flat, saltbush shrubland
Big brown bat	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Big free-tailed bat	Grassland, herbaceous wetland, saltbush shrubland
Brazilian free-tailed bat	Herbaceous wetland, saltbush shrubland
California leaf-nosed bat	Saltbush shrubland

Table 3.8-18 BLM Sensitive and State-protected Species Potentially Occurring at the Southern Terminal located near IPP (Design Option 2)

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
California myotis	Greasewood flat, herbaceous wetland, saltbush shrubland
Fringed myotis	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Hoary bat	Grassland, herbaceous wetland, saltbush shrubland
Long-eared myotis	Greasewood flat, herbaceous wetland, saltbush shrubland
Long-legged myotis	Herbaceous wetland, saltbush shrubland
Pallid bat	Grassland, greasewood flat, saltbush shrubland
Silver-haired bat	Greasewood flat, herbaceous wetland
Spotted bat	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Townsend's (Western) big-eared bat	Greasewood flat, herbaceous wetland, saltbush shrubland
Western pipistrelle	Herbaceous wetland, saltbush shrubland
Western red bat	Herbaceous wetland
Western small-footed myotis	Grassland, greasewood flat, herbaceous wetland
Yuma myotis	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Mammals - Other	
Dark kangaroo mouse	Grassland, saltbush shrubland
Desert Valley kangaroo mouse	Saltbush shrubland
Kit fox	Grassland, saltbush shrubland
White-tailed prairie dog	Grassland, greasewood flat, saltbush shrubland
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Swainson's hawk	Grassland, saltbush shrubland
Ferruginous hawk	Grassland, saltbush shrubland
Golden eagle	Grassland, saltbush shrubland
Peregrine falcon	Grassland, herbaceous wetland, saltbush shrubland
Prairie falcon	Grassland, saltbush shrubland
Columbian sharp-tailed grouse	Grassland, greasewood flat, herbaceous wetland
Mountain plover	Grassland
Long-billed curlew	Grassland, herbaceous wetland
Black tern	Herbaceous wetland
Burrowing owl	Grassland, saltbush shrubland
Long-eared owl	Grassland, saltbush shrubland
Short-eared owl	Grassland, greasewood flat, herbaceous wetland
Black swift	Herbaceous wetland
Loggerhead shrike	Grassland, greasewood flat, saltbush shrubland

Table 3.8-18 BLM Sensitive and State-protected Species Potentially Occurring at the Southern Terminal located near IPP (Design Option 2)

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Crissal thrasher	Saltbush shrubland
Gray vireo	Saltbush shrubland
Vesper sparrow	Grassland
Bobolink	Grassland, herbaceous wetland
Reptiles	
Banded Gila monster	Grassland
Corn snake	Grassland, greasewood flat, herbaceous wetland
Desert iguana	Saltbush shrubland
Long-nosed leopard lizard	Greasewood flat, saltbush shrubland
Midget faded rattlesnake	Greasewood flat, saltbush shrubland
Smooth greensnake	Grassland, greasewood flat, herbaceous wetland
Speckled rattlesnake	Saltbush shrubland
Utah milk snake	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Western banded gecko	Saltbush shrubland
Western threadsnake (blindsnake)	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Terrestrial Invertebrates	
Eureka mountainsnail	Grassland, saltbush shrubland
Great Basin silverspot (Nokomis fritillary) butterfly	Herbaceous wetland
Grey's silverspot (Grey's fritillary) butterfly	Grassland
Honey Lake blue butterfly	Saltbush shrubland
MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	Herbaceous wetland, saltbush shrubland
Mono Basin skipper (Railroad Valley skipper) butterfly	Grassland
Rice's blue butterfly	Saltbush shrubland
White River wood nymph butterfly	Grassland, herbaceous wetland

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is sited entirely within the Southern Terminal located near IPP (Design Option 2) area. BLM sensitive and state-protected species that may occur at the Southern Substation located near IPP (Design Option 3) are presented in **Table 3.8-18**. The types of direct and indirect impacts of construction and operation of the Southern Substation located near IPP (Design Option 3) to the 60 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Southern Substation located near IPP (Design Option 3) are presented in Section 3.5 Vegetation. No special status raptor nests are documented within the Southern Substation located near IPP (Design Option 3) siting area. Species-specific mitigation measures are discussed below.

3.8.6.2 Impacts to Special Status Wildlife from Design Options

Design Option 2 –DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Because the implementation of Design Option 2 would utilize the same alternative routes and construction techniques as the proposed Project, impacts to special status wildlife from construction and operation of Design Option 2 would be similar to those discussed under the alternative routes. Differences between Design Option 2 and the proposed Project include the location of the Southern Terminal and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The Southern Terminal would be located near IPP in Utah instead of near Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP.

Table 3.8-19 provides a summary of impacts associated with Design Option 2. Impacts from Design Option 2 facilities would be similar to impacts described in Section 3.8.6.1, Impacts from Terminal Construction and Operation, and Section 3.8.6.2, Impacts Common to all Alternative Routes and Associated Components. Greater sage-grouse and Utah prairie dogs do not occur in the area proposed for these facilities. The same design features, BMPs, and mitigation measure listed for the Northern Terminal would be implemented to minimize impacts resulting from Design Option 2.

Table 3.8-19 Summary of Design Option 2 Impact Parameters for Vegetation Communities Associated with Special Status Wildlife Species

Design Option 2 Converter/Substation
• Approximately 181 acres of total impacts to vegetation communities associated with special status species would occur. • Approximately 18 acres of construction and 11 acres of operation impacts to grasslands would occur. • Approximately 17 acres of construction and 11 acres of operation impacts to greasewood flats would occur. • Approximately 7 acres of construction and 4 acres of operation impacts to herbaceous wetlands would occur. • Approximately 139 acres of construction and 87 acres of operation impacts to saltbush shrublands would occur.

Design Option 3 Phased Build Out

Because the implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed Project, albeit in a phased approach, impacts to special status wildlife from construction and operation of Design Option 3 would be the same as those discussed under the alternative routes.

3.8.6.3 Impacts Common to All Alternative Routes and Associated Components

Potential impacts to special status wildlife species from construction, operation, and maintenance of the proposed Project include habitat loss and fragmentation; displacement of wildlife during construction, operation, and maintenance; avoidance of the 2-mile transmission line corridor during construction and operation; cumulative effects from human disturbance and energy development; and mortality.

Habitat disturbance can be further categorized into construction and operation impacts. Construction impacts account for all disturbances caused during construction of the proposed Project, including vegetation removal, increased human activity, and increased noise levels. Operation impacts are defined as impacts that remain after construction-related reclamation efforts are complete and will last as long as the Project is in operation. Examples of operation impacts include habitat disturbance in areas where facilities will be sited, which would not be reclaimed until after the end of the Project's design life (decommissioning). Impacts to habitat can be further categorized as direct and indirect. Direct impacts to habitat result when habitat is destroyed or is converted to a form that is unsuitable for the affected species. The primary potential indirect impact to habitat occurs when wildlife avoids or is displaced from otherwise suitable habitat as a result of increased noise and human activity.

The primary impacts associated with operation of transmission lines and associated facilities are mortalities as a consequence of electrocution or collision with Project components. Electrocution is primarily associated with smaller (i.e., 100-kV or less) transmission lines, due to the size of towers and spacing of the wires (APLIC 2006). For the proposed Project, the 34.5-kV lines associated with the ground electrode beds are the only components with electrocution potential. The potential for collision impacts is influenced by species characteristics and environmental characteristics. The manner in which birds utilize habitats near transmission lines affects the probability of collisions (APLIC 1994). Other potential impacts include avoidance of otherwise suitable habitat due to the presence of a transmission line, and the increased noise and human presence that are the result of regular maintenance activities.

In addition, raptors commonly perch on transmission structures to hunt. Increased predation on special status species, such as greater sage-grouse, Wyoming pocket gopher, white-tailed prairie dog, and pygmy rabbit, could occur as a result of project operation. Increased predation by corvids and other predatory and scavenging species, which tend to accompany human presence, also may increase.

Construction Impacts

The types of direct and indirect impacts of construction activities to special status wildlife species are generally the same as discussed in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components.

Operation Impacts

The types of direct and indirect impacts of operation activities to special status wildlife species are generally the same as discussed in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components.

3.8.6.4 Region I

Tables 3.8-20, **3.8-21**, **3.8-22**, **3.8-23**, and **3.8-24** provide a tabulation of estimated impacts associated with the alternative routes and other Project components in Region I. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below. No national forests are crossed by the Project in Region I.

Table 3.8-20 Summary of Region I Alternative Route Impact Parameters for Greater Sage-grouse Leks

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Wyoming				
Number of occupied leks within 0.5 mile of reference lines in Wyoming	0	0	1	3
Number of occupied leks within 1 mile of reference lines in Wyoming	9	9	12	14
Number of occupied leks within 2 miles of reference lines in Wyoming	16	17	24	23
Number of occupied leks within 3 miles of reference lines in Wyoming	21	21	28	28
Number of occupied leks within 4 miles of reference lines in Wyoming	28	28	38	35
Average distance of leks within 4 miles of reference lines in Wyoming (miles)	2.38	2.15	2.11	2.32

Table 3.8-20 Summary of Region I Alternative Route Impact Parameters for Greater Sage-grouse Leks

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of occupied leks within 11 miles of reference lines in Wyoming	99	95	131	121
Colorado				
Number of occupied leks within 0.5 mile of reference lines in Colorado	3	3	0	3
Number of occupied leks within 1 mile of reference lines in Colorado	8	7	4	7
Number of occupied leks within 2 miles of reference lines in Colorado	11	10	8	10
Number of occupied leks within 3 miles of reference lines in Colorado	13	11	14	11
Number of occupied leks within 4 miles of reference lines in Colorado	13	12	21	12
Average distance of leks within 4 miles of reference line in Colorado (miles)	1.63	1.68	2.33	1.68
Number of occupied leks within 11 miles of reference lines in Colorado	38	42	65	44
Region I Total				
Total number of occupied leks within 0.5 miles of reference lines Region I	3	3	1	6
Total number of occupied leks within 1 mile of reference lines Region I	17	16	16	21
Total number of occupied leks within 2 miles of reference lines Region I	27	27	32	33
Total number of occupied leks within 3 miles of reference lines Region I	34	32	42	39
Total number of occupied leks within 4 miles of reference lines Region I	41	40	59	47
Average distance of leks within 4 miles of reference lines in Region I (miles)	2.14	2.01	2.19	2.16
Number of occupied leks within 11 miles of reference lines in Region I	137	137	196	165
Length of transmission line in miles (habitat fragmentation and collision potential)[1]	155	159	186	171

Table 3.8-21 Summary of Region I Alternative Route Impact Parameters for Greater Sage-grouse Habitat

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
Habitat Disturbance	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Impacts to Wyoming core population areas (acres)	170	42	18,444	170	42	18,444	235	55	24,872	170	42	18,444
Percentage of existing habitat impacted within the Region I greater sage-grouse analysis area	0.02	<0.01	2.59	0.02	<0.01	2.59	0.03	0.01	3.49	0.02	<0.01	2.59
Impacts to Colorado Preliminary Priority Habitat (acres)	517	144	47,340	381	97	45,416	837	220	80,816	381	97	45,416
Percentage of existing habitat impacted within the Region I greater sage-grouse analysis area	0.04	0.01	3.75	0.03	<0.01	3.60	0.07	0.02	6.41	0.03	<0.01	3.60
Impacts to Colorado General Habitat (acres)	346	93	35,200	439	112	59,620	539	141	50,038	439	112	59,620
Percentage of existing habitat impacted within the Region I greater sage-grouse analysis area	0.04	0.01	4.39	0.05	0.01	7.44	0.07	0.02	6.25	0.05	0.01	7.44

[1] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-22 Summary of Region I Greater Sage-grouse Attendance at Leks within 4 Miles of the Reference Line

Parameter[1]	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Wyoming				
Number of active leks	28	28	38	35
Peak male attendance combined 2003 – 2012[2]	653	667	815	856
Minimum male attendance combined 2003 – 2012[3]	98	94	112	117
3-year average lek attendance[1]	11.51	12.23	10.23	10.99
Average attendance across all leks[4]	12.73	13.38	12.92	12.92
Total attendance 2003 – 2012[1]	2,560	2,676	3,425	3,361
Number of leks with no attendance 2008 – 2012[5]	6	6	12	9
Survey effort[6] (percent)	71.8	71.4	69.7	74.3
Colorado				
Number of active leks	13	12	21	12
Peak male attendance combined 2003 – 2012[2]	231	247	519	247
Minimum male attendance combined 2003 – 2012[3]	7	7	69	7
3-year average lek attendance	19.08	15.92	31.66	15.92
Average attendance across all leks[4]	7.28	8.08	13.51	8.08
Total attendance 2003 – 2012	925	946	2594	946
Number of leks with no attendance 2008 – 2012[5]	5	5	6	5
Survey effort[6] (percent)	97.7	97.5	91.4	97.5

[1] Lek count numbers are male birds only, most recent data used.

[2] Sum of the 10-year peak annual counts from all leks within 4 miles combined (2003-2012).

[3] Sum of the 10-year minimum count from all leks within 4 miles combined (2003-2012).

[4] Total males observed/Number of surveys.

[5] Although leks are classified as active or occupied, surveys have not observed male attendance over past 5 years.

[6] Number of surveys/Number of potential surveys (10 years x 28 leks = 280 potential surveys).

Table 3.8-23 Summary of Region I Greater Sage-grouse Lek Visibility by Alternative Route

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alterative I-D
Wyoming				
Number of visible occupied leks within 0.5 mile of reference lines[1]	0	0	0	3
Number of visible occupied leks within 1 mile of reference lines	7	8	10	12
Number of visible occupied leks within 2 miles of reference lines	11	14	20	18
Number of visible occupied leks within 3 miles of reference lines	17	20	26	22

Table 3.8-23 Summary of Region I Greater Sage-grouse Lek Visibility by Alternative Route

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alterative I-D
Number of visible occupied leks within 4 miles of reference lines	28	28	36	35
Average distance of visible leks within 4 miles of reference lines	2.38	2.15	2.08	2.09
Colorado				
Number of visible occupied leks within 0.5 mile of reference lines	2	1	0	1
Number of visible occupied leks within 1 mile of reference lines	6	4	3	4
Number of visible occupied leks within 2 miles of reference lines	6	8	6	8
Number of visible occupied leks within 3 miles of reference lines	11	10	14	10
Number of visible occupied leks within 4 miles of reference lines	12	12	21	12
Average distance of visible leks within 4 miles of reference lines	1.63	1.69	2.33	1.69
Region I Total				
Total number of visible occupied leks within 0.5 mile of reference lines in Region I	2	1	0	4
Total number of visible occupied leks within 1 mile of reference lines in Region I	13	12	13	16
Total number of visible occupied leks within 2 miles of reference lines in Region I	17	22	26	26
Total number of visible occupied leks within 3 miles of reference lines in Region I	28	30	40	32
Total number of visible occupied leks within 4 miles of reference lines in Region I	40	40	57	47
Average distance of visible leks within 4 miles of reference lines in Region I	2.14	2.01	2.17	2.16
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	155	159	186	171

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

The number of occupied greater sage-grouse leks visible from the reference lines and the average distance of occupied leks visible from the reference lines in Region I are presented in **Table 3.8-23**, Summary of Region I Alternate Route Impact Parameters (Visibility) for Greater Sage-grouse. The greatest number of occupied leks visible from the reference line, 57, would be impacted by Alternative I-C. However, the number of occupied leks and the average distance of occupied leks from the reference line are generally similar for all of the Alternative Routes in Region I. Occupied leks visible from within 4 miles of the reference line would potentially be at greater risk of predation by perching raptors. However, implementation of **SSWS-5** would limit raptor and corvid predation and impacts to greater sage-grouse

visible from the reference line. Thus, impacts associated with these occupied leks are expected to be low magnitude.

Explanation of Visibility Impact Analysis for Occupied Greater Sage-grouse Leks

The numbers of occupied greater sage-grouse leks visible from the reference lines, as presented in **Table 3.8-23**, were based on line of sight calculations, which accounted for a number of variables. The vertical distance above the reference line by which by raptors and corvids may perch on transmission tower structures was based on the assumption that raptors and corvids would perch an average of 150 vertical feet above ground surface on tower structures as well as an assumed raptor height of 2 feet. Thus, visibility of occupied greater sage-grouse leks was based on line of sight from 152 vertical feet above the reference line. Visibility calculations also were based on topographical variation within 4 miles of the reference line that would affect visibility of greater sage-grouse leks from potential perches 152 vertical feet above the reference line. For example, a greater sage-grouse lek in an area with flat terrain might be visible from 1 mile away, whereas a lek in an area with hilly or mountainous terrain may not be visible from 1 mile away due to an obstruction to line of sight. Due to a lack of data on vegetative structure and height within 4 miles of the reference line, vegetative height was not figured into line of sight calculations.

Alternative I-A (Applicant Proposed)

Federally Listed and Candidate Species

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two candidate species, and 64 BLM sensitive and state-protected species. Species-specific impact discussions are presented below. No suitable habitat for the Canada lynx occurs along Alternative I-A, therefore impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. **Table 3.8-24** provides a summary of special status raptor nests within 1 mile of the reference line in Region I. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-A.

Greater Sage-grouse (Candidate)

Greater sage-grouse may be found along more that 95 percent of the Alternative I-A route in Carbon and Sweetwater counties, Wyoming and Moffat County, Colorado. Moffat County, Colorado contains the largest population of greater sage-grouse in Colorado. The WGFD and the CPW have designated “core population areas” within their respective states. These areas contain a majority of the breeding population of greater sage-grouse in a specific area and are considered vital to maintaining greater sage-grouse populations.

As presented in **Table 3.8-20**, a total of 41 occupied/active leks occur within 4 miles of Alternative I-A (i.e., 28 occupied leks in Wyoming and 13 active leks in Colorado). Occupied/active leks are those observed to have documented activity in the past 10 years. In addition, Alternative I-A crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

Impacts to greater sage-grouse from the construction and operation of the proposed Project can be grouped into two main categories, direct and indirect. Direct impacts include habitat loss, disturbance from construction activities resulting in temporary displacement of individuals, and mortality when greater sage-grouse collide with transmission lines or their supporting infrastructure, such as guy wires. Indirect impacts may include avoidance as a result of increased predation from perching raptors and human activity during construction and operation.

Table 3.8-24 Special Status Raptor Nests within 1 Mile of the reference Line in Region I[1]

Species	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D	Tuttle Easement Micro-siting Option 1	Tuttle Easement Micro-siting Option 2	Tuttle Easement Micro-siting Option 3	Tuttle Easement Micro-siting Comparable Portion of Alternative I-D	Mexican Flats alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Bald eagle	2	0	0	0	0	0	0	0	0	0	0	0
Ferruginous hawk	102	97	145	91	0	0	0	0	6	2	8	2
Golden eagle	24	35	66	34	12	12	12	12	4	9	4	0
Prairie falcon	3	25	7	6	1	1	1	1	0	0	0	0
Swainson's hawk	2	1	5	1	0	0	0	0	0	0	0	0
Burrowing owl	7	7	5	7	0	0	0	0	1	0	0	0
Unknown raptor species	47	60	102	69	35	35	35	33	3	31	6	1
Totals	187	225	330	208	48	48	48	46	14	42	18	3

[1] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because nests may have been utilized by either special status raptors or non-special status raptors.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Construction Impacts

Construction activities may result in permanent habitat loss, fragmentation, and the temporary displacement of greater sage-grouse from construction areas due to noise and increased human activity. The disturbance and degradation of sagebrush habitat can reduce the carrying capacity of local breeding populations of greater sage-grouse, especially in areas where high quality sagebrush habitat is limited (Braun 1998; Connelly et al. 2000). Alternatively, greater sage-grouse may simply avoid otherwise suitable habitat as the density of roads and transmission lines increases (Holloran 2005). Greater sage-grouse may avoid previously occupied areas due to noise and disturbance from vehicle traffic (Lyon and Anderson 2003). Depending on the season, displacement could impact birds on leks, nesting and brood-rearing hens, and birds on winter ranges. Greater sage-grouse that are displaced by construction activities might move to areas with lower quality habitat, resulting in an overall effect of reducing survival or breeding success. Fragmentation of sagebrush habitats also may interrupt the exchange of genetic material between distinct isolated areas of suitable breeding habitat. Additional impacts from transmission lines and associated access roads (e.g., two-tracks, mowed or cleared access ways) may include direct mortality of nesting hens and chicks, facilitation of travel ways for predators, and the spread of invasive and noxious plant species (Gelbard and Belknap 2003; Science Applications International Corporation [SAIC] 2001). Secondary roads that are used more often to access construction areas also may result in traffic that can negatively impact greater sage-grouse through increased noise or vehicular and pedestrian harassment. New secondary access roads (i.e., two-tracks) that are not gated to restrict public access or reclaimed immediately following construction also may provide increased human access to previously inaccessible greater sage-grouse habitats, allowing for increased pedestrian harassment at leks sites and increased hunting pressure. Ground disturbance associated with secondary road construction and use also increases the potential for noxious weed invasion, and vehicles driving these roads may increase the possibility of igniting fires (Leu et al. 2008).

The potential for greater sage-grouse mortality from construction equipment would likely be very low. Equipment used in transmission line construction generally moves at a slow rate or is stationary for long periods (e.g., cranes). The risk of direct mortality to greater sage-grouse from construction is most likely limited to nesting hens or young chicks that have limited mobility.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas for greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.) and implement seasonal timing restrictions and protection buffers in accordance with BLM IM 2010-012, BLM IM 2012-043, EO 2011-5, individual state greater sage-grouse management/conservation plans, BLM RMPs, and forest managements plans. Adherence to these regulations and guidelines would reduce impacts to greater sage-grouse during construction. In addition, implementation of TWE-26 and **VEG-1** would aid in reclamation activities and restoring communities (i.e., sagebrush shrubland) to native ecosystems, especially in areas where reclamation is difficult. Implementation of **NX-1** and **NX-2** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive plant species.

Operation Impacts

In addition to potential impacts to greater sage-grouse from construction activities, operation-related impacts can include the following:

1. Increased predation on and harassment of greater sage-grouse from increased available perch locations for raptors and corvids.
2. Potential avoidance of tall structures that provide perching opportunities for raptors and corvids.
3. Increased fragmentation and reduction of habitat quality of otherwise suitable greater sage-grouse habitat.

4. Increased mortalities as a result of maintenance activities along new or improved access roads (e.g., two-tracks, mowed or cleared access ways), which could result in vehicle collisions and nest destruction. New or improved secondary access roads also may lead to increased public use of roads that were previously inaccessible if not properly gated or signed to restrict access. This may lead to increased greater sage-grouse disturbance as a result of recreation activities (e.g., four-wheeling, hunting, bird watching, etc.).

Avian mortality from collisions with transmission lines is well documented (Brown and Drewien 1995). While greater sage-grouse are predominantly a ground-dwelling species, the risk for collision during flight is heavily dependent upon transmission line sizes (e.g., 34.5-kV vs. 600-kV) and locations, such as locations between loafing and feeding areas or along migration routes. Highest collision probabilities appear to occur where greater sage-grouse typically fly between foraging and loafing habitats bisected with lower voltage overhead lines (SAIC 2001).

Factors that influence the risk of collision to individual birds as they encounter transmission lines are varied and include flight characteristics, previous experience with transmission lines (typically a function of the bird's age), location of the transmission line, weather, and transmission line structural characteristics (APLIC 1994). Past research has shown that the static wire, also referred to as the shield or groundwire, has posed the greatest collision danger to birds (APLIC 1994; Faanes 1987). Most of these collisions occur with static wires when birds increased their altitude in apparent attempts to avoid conductor wires. Birds maneuvering to avoid the conductor wires actually increased collision risk, and in the absence of static wires most collisions could have been avoided. For the proposed Project, static wires on the larger (e.g., 500-kV and 600-kV) transmission lines are typically positioned at the top of the structures and, therefore, pose less of a collision threat to low-flying greater sage-grouse. The greatest collision risks to greater sage-grouse from the proposed Project are the guy wires associated with each tower. The guy wires support the towers and are typically angled to the anchor point. Therefore, bird species, such as greater sage-grouse, may have a greater potential for collision risk because of the smaller wing to body ratio (i.e., heavy wing-load), resulting in lower flight heights and a greater occurrence of takeoffs and landings crossing guy wire heights. Because of their lack of flying efficiency, species such as the greater sage-grouse may potentially be more likely to collide with the guy wires unless the wires are properly marked or even eliminated in high use habitat areas (i.e., using self-supporting steel lattice structures instead of guyed lattice structures).

Documentation of direct mortality of greater sage-grouse resulting from collisions with transmission lines is limited. One study in Idaho showed that a substantial proportion of annual mortality can be caused by transmission line collisions. Beck et al. (2006) monitored survival of 15 radio-collared juvenile greater sage-grouse in the Medicine Lodge area of Clark County and 43 juvenile greater sage-grouse in the Table Butte area of Clark and Jefferson Counties, Idaho in 1997 and 1998. Although all mortality documented in the Medicine Lodge area was attributed to predation, 33 percent of the juvenile mortality (two of the six fatalities) in the Table Butte area was attributed to collisions with transmission lines. The actual occurrence of greater sage-grouse collisions with transmission lines is difficult to evaluate and juvenile mortality in the Table Butte area may have been more of a function of available habitat and the actual location of the transmission line rather than the transmission line design itself (i.e., transmission line was not sited properly to avoid important habitats). In addition, a majority of transmission lines are located in remote areas with little human presence and dead birds are often picked up by scavengers before humans are able to find and report them; therefore, reported losses must be considered a superficial measure of its actual collision mortality (Faanes 1987; Longridge 1986; Thompson 1978).

Avian predators, particularly raptors and corvids, are attracted to overhead utility lines because they provide perches for various activities, including hunting (APLIC 2006). Transmission poles increase a raptor's range of vision, allow for greater speed during attacks on prey, and serve as territorial markers (APLIC 2006; Manville 2002; Steenhof et al. 1993). Most research on transmission lines and raptor and corvid populations has documented a positive relationship between transmission lines and increased perches and nest sites. Although a direct correlation between transmission lines and increased predation

risks for greater sage-grouse has not been documented, greater sage-grouse may avoid transmission lines due to increased predation risk (Lammers and Collopy 2007). It also is important to note that in some regions of the U.S., greater sage-grouse are an important food item for raptor species (i.e., golden eagles). This is especially true when other prey populations are exhibiting down cycles (e.g., black-tailed jackrabbit, white-tailed prairie dog, etc.). Golden eagles follow greater sage-grouse during their seasonal migrations, and numerous researchers have documented golden eagle predation on greater sage-grouse (Gibson and Bachman 1992; Schroeder et al. 1999). Golden eagle predation of male birds at leks can be substantial in certain areas, especially if other prey populations are low. Golden eagles often fly over and attack birds on leks, disrupting lek behaviors and scattering birds (Hartzler 1974; Jenni and Hartzler 1978). Other documented avian predators of greater sage-grouse or their nests include black-billed magpie, common raven, ferruginous hawk, red-tailed hawk, rough-legged hawk, Swainson's hawk, gyrfalcon, and northern goshawk (Schroeder et al. 1999). Recent research conducted for the Sierra Pacific Power Company's Falcon-Gondor transmission line suggests that greater sage-grouse nests with more total shrub cover had a greater probability of success than nests with less cover, regardless of distance from the transmission line (Blomberg et al. 2010). Kolada et al. (2009) reported higher greater sage-grouse nest success in California as shrub cover increased. Therefore, this research suggests that the risk of increased raptor and corvid predation on greater sage-grouse may be mitigated by maintaining and restoring sagebrush canopy cover, particularly within important nesting and brood-rearing habitat.

In addition to direct mortality from collisions and increased predation on greater sage-grouse by raptors and corvids, transmission lines may cause greater sage-grouse to abandon otherwise suitable habitat or disrupt movement patterns among seasonal habitats (SAIC 2001). Transmission lines might also serve as barriers to movement as a result of avoidance behavior (Desholm and Kahlert 2005; Robel et al. 2004). Greater sage-grouse and other prairie gallinaceous birds have evolved in habitat devoid of tall structures. It is unclear how these species react to the height of these structures. Studies completed on greater and lesser prairie-chickens have suggested avoidance concerns because of the height of transmission lines. This avoidance may create an unintentional buffer along the transmission lines and roads of at least 328 feet in width (and probably more) for prairie-chickens. There also appears to be avoidance in the placement of nests and leks (Pruett et al. 2009a,b). These studies showed that greater and lesser prairie-chickens were not only more likely to avoid transmissions lines, but also less likely to nest, cross, or maintain a home range near transmission lines (Pruett et al. 2009a,b). The movement of the prairie-chickens was shown to be altered by the transmission lines, creating habitat fragmentation (Pruett et al. 2009a,b).

In northern California, transmission lines have had a negative impact on lek attendance and strutting activity has ceased on all leks within one mile of one particular transmission line, while other transmission lines located in greater sage-grouse habitat also are believed to be impacting populations (Bi-State Local Planning Group [Bi-State Plan] 2004). A study in Washington State found that 19 of 20 leks (95 percent) documented within five miles of 500-kV transmission lines are now vacant, while the vacancy rate for leks further than 5 miles is 59 percent (22 of 37 leks; Washington Department of Fish and Wildlife [WDFW] 2008). In Oregon, a 250-kV transmission line was constructed within 0.5 miles of a greater sage-grouse lek that had an average attendance of 41 males during the period 1949 to 1980. After the transmission line was constructed from 1981 to 1982, an average of only five males per lek was counted between 1982 and 2005, with no birds being counted on the lek since 2006 (Oregon Department of Fish and Wildlife [ODFW] 2009). The cause of this decline or perhaps extirpation cannot be directly linked to the transmission line, but it is likely part of a cumulative effect from development in the area. It also was noted that the Oregon statewide greater sage-grouse population from 1980 to 1988 (the period when the lek declined) reached relatively high levels.

A majority of literature on transmission line impacts was derived from studies that looked at several different facilities associated with energy development (e.g., oil and gas well pads, access roads, compressor stations, transmission lines, etc.). Additionally, due to very limited data on collision mortality of greater sage-grouse from transmission lines, it cannot be determined if collision rates vary by capacity of transmission lines. Based on the lack of specific research on transmission lines and ambiguity associated

with results of many of these studies, it also is not possible to differentiate the relative magnitude of indirect impacts based on capacity of the transmission line. To the extent that increased predation and harassment caused by raptors and corvids may influence greater sage-grouse use of adjacent habitats, there is probably little difference based on capacity of transmission lines, as all transmission lines provide opportunities for raptors and corvids to perch. Likewise, ground disturbance would occur regardless of transmission line capacity, and therefore all transmission lines would increase the potential for establishment of noxious weeds and lead to increased human activity for maintenance purposes. If the primary impact to greater sage-grouse is avoidance of tall structures, however, then it is likely that shorter towers used on 34.5-kV versus 500-kV lines would have less impact, but this cannot be confirmed based on available literature. It also is not known if smaller capacity lines result in less "behavioral" habitat fragmentation (i.e., fragmentation resulting from greater sage-grouse being more reluctant to cross 500-kV lines than 345-kV lines.

***SSWS-5**: To reduce impacts to greater sage-grouse from operation of the proposed Project, design features specific to greater sage-grouse would be implemented.*

- *To limit raptor and corvid predation on greater sage-grouse, TWE would be required to construct anti-perching devices on segments of the proposed Project near high quality greater sage-grouse habitat (e.g., within 4 miles of occupied/active leks, within core areas, within PPH, etc.) in consultation with the BLM, Western, and applicable state wildlife agencies.*
- *To limit the potential for greater sage-grouse collisions with guy wires, TWE would be required to outfit guy wires with agency approved bird diverters within high quality greater sage-grouse habitat, or alternatively, to construct alternative structures such as self-supporting steel lattice structures or self-supporting tubular H-frame structures instead of guyed lattice structures within greater sage-grouse habitat.*

Effectiveness: **SSWS-5** would help minimize the potential for increased predation on greater sage-grouse by limiting raptor and corvid perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors and corvids on greater sage-grouse. Marking guy wires would increase the visibility of guy wires and would reduce the potential for collisions, especially in areas between important roosting and foraging habitat. A study in South Carolina involving two 115-kV transmission lines showed that the bird collision rate was 53 percent lower for marked transmission lines versus unmarked transmission lines (Savereno et al. 1996). The study concluded that aviation markers were effective at increasing the transmission line visibility and reducing bird collisions. Alternatively, constructing alternative structures such as self-supporting steel lattice structures instead of guyed lattice structures would eliminate the collision potential from guy wires to greater sage-grouse.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. Nonetheless, given the amount of important greater sage-grouse habitat crossed by the proposed Project under Alternative I-A in Wyoming and Colorado (**Table 3.8-21**), mortality from operation of the proposed Project may occur.

Offsite Compensatory Mitigation

In an effort to comply with BLM IM 2012-043 guidance, TWE has developed a framework for impact analysis that is focused on the listing factors considered by the USFWS for evaluating future listing and

protection of greater sage-grouse under the ESA. As part of the framework, consideration of compensation for both short-term and long-term direct and indirect loss of greater sage-grouse and its habitat will be included in the TWE Greater Sage-grouse Mitigation and Habitat Equivalency Analysis Plan. This framework is included in **Appendix G**. This plan will be completed upon the final assessment of the full range of impacts resulting from the construction, operation, and maintenance of the TWE project. Furthermore, the framework specifies the use of Habitat Equivalency Analysis (HEA), conducted by TWE, as a standardized basis for determining a one-to-one ratio for habitat services lost or mitigated. TWE intends to continue compliance with BLM IM 2012-043 through considering the implementation of both on-site and off-site compensatory mitigation measures developed during the HEA process.

Overview of Habitat Equivalency Analysis

The HEA is a process of quantifying interim and permanent habitat disturbance, measured as a loss of habitat services from pre-disturbance conditions, and scaling compensatory habitat requirements to those disturbances (Dunford et al. 2004; King 1997; Kohler and Dodge 2006; National Oceanic and Atmospheric Administration [NOAA] 2009, 2006). Habitat services are generally quantified using a metric that is representative of the functionality or quality of habitat (i.e., the ability of that habitat to provide wildlife "services" such as nest sites, forage, cover from predators, etc.). When wildlife habitat is the primary service of interest, areas with the highest habitat service levels are those areas with highest habitat quality. Interim (or short-term) habitat disturbances are those services that are absent during certain phases of the Project that would have been available if that disturbance had not occurred (e.g., temporary vegetation losses, temporary soil partitioning, temporary displacement of wildlife populations). Permanent (or long-term) habitat disturbances are those that remain after project construction and interim reclamation and recovery are complete (e.g., permanent vegetation loss, permanent loss of wildlife or fisheries populations, irrecoverable impacts to soils or water as a result of contamination). The benefits of applying HEA to the Project are that:

- The approach has been thoroughly evaluated and documented in scientific literature and has been tested in multiple court cases.
- It provides a quantitative analysis of direct and indirect impacts.
- It provides a standard framework for developing appropriate mitigation ratios.
- It is applicable to any ecosystem type where appropriate habitat service metrics can be defined.

Upon completion of the HEA, TWE will work with cooperating agencies and stakeholders to develop mitigation measures that can be used to compensate for the interim and permanent losses of habitat services resulting from project construction, operation, and maintenance. Mitigation measures likely to be considered include, but are not limited to:

1. Fence marking, modification, or removal – Fences would be marked, modified, or removed to reduce or remove threats to greater sage-grouse. Marking would be prioritized in areas near leks, in winter concentration areas, in known migration corridors, or in areas between known roosting and foraging habitats.
2. Sagebrush restoration or enhancement projects – Sagebrush restoration or enhancement projects might include seeding sagebrush and associated understory vegetation into previously disturbed or burned areas or transplanting already established sagebrush stems and seedlings into areas where sagebrush has been removed or thinned. Appropriate land management agency or landowner coordination would be important to ensure sagebrush enhancement activities support ongoing and future land use objectives.
3. Understory improvement projects – Understory habitat conditions could be improved by over-seeding existing greater sage-grouse habitats with appropriate forbs, grasses, or other desirable plant species; seeding previously disturbed areas with forbs and grasses to create a suitable mosaic of habitat for various life stages of greater sage-grouse; removing undesirable

non-native understory species; or improving residual cover of existing understory species to increase cover and improve nest success.

4. Conifer removal – In areas where conifers are encroaching into suitable greater sage-grouse habitat, conifer removal (specifically removal of pinyon pine and juniper) could be used to reduce habitat fragmentation and to restore previously unsuitable habitat.
5. Brood-rearing habitat improvement – During summer months, mesic habitats adjacent to appropriate cover are necessary for brood-rearing and summer use. In areas where these habitats have been removed, altered, or are not available for other reasons, habitat enhancements focused on restoring or creating mesic habitats could be used to improve brood-rearing conditions.
6. Conservation easements – Where possible, conservation easements could be used to provide long-term contractual protection of high-quality greater sage-grouse habitat, conservation efforts, and improvement projects. TWE's ability to acquire conservation easements would be dependent upon the willingness of private landowners to participate in a conservation program. Landowner coordination would be important to ensure that activities support ongoing and future land use objectives.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

Construction, operation, and decommissioning impacts to the whooping crane, interior least tern, and piping plover under Alternative I-A are anticipated to be the same as discussed in Section 3.8.6.1, Impacts from Terminal Construction and Operation.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur and TWE would not be required to conduct Section 7 consultation with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

Western yellow-billed cuckoos are extremely rare summer residents in western Wyoming and Colorado. The majority of suitable habitat for this species occurs along Alternative I-A, along the Yampa River in Moffat County, Colorado.

Alternative I-A would result in the construction and operation disturbance of 43 acres and 4 acres, respectively, of potentially suitable woody riparian and wetland habitat. These areas represent 0.09 percent and <0.01 percent, respectively, of available potential habitat within the Region I western yellow-billed cuckoo analysis area. Habitat loss is the primary threat to the western yellow-billed cuckoo (Floyd et al. 2005; Corman and Wise-Gervais 2005). Western yellow-billed cuckoos appear to require large tracts of contiguous habitat (UDWR 2005) and population declines across the western U.S. are primarily due to the loss of cottonwood riparian habitat. This loss is primarily a result of conversion to agriculture, dams and river flow management, bank protection, overgrazing, and competition from exotic plants such as tamarisk (Bennett and Keinath 2001). Western yellow-billed cuckoos are further threatened by their low population size, extreme population fluctuations, and patchy distribution (Bennett and Keinath 2001). Therefore, impacts to occupied habitat may have population level impacts if not properly mitigated (e.g., avoiding construction during the breeding season, etc.).

Additional indirect impacts, such as individual displacement and avoidance of preferred habitat, also would occur as a result of increased noise and human activity associated with construction during the breeding

season (March 15 to October 15). Improved access as a result of Project roads may further fragment suitable habitat and result in increased disturbance to the western yellow-billed cuckoo.

***SSWS-6**: To prevent impacts to the western yellow-billed cuckoo during the breeding season, TWE would avoid construction within potentially suitable habitat from March 15 to October 15, or, alternatively, would conduct breeding western yellow-billed cuckoo surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*

Effectiveness: To minimize impacts to the western yellow-billed cuckoo during the breeding season, TWE also has committed to implement seasonal timing restrictions in applicable areas (TWE-32). More specifically, **SSWS-6** would require TWE to avoid habitat removal between March 15 and October 15 or, alternatively, to conduct western yellow-billed cuckoo surveys and implement appropriate mitigation in coordination with the BLM, Western, and state wildlife agencies.

Operation of Alternative I-A would incrementally increase the collision potential for western yellow-billed cuckoos as they move to and from nesting and foraging areas. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the breeding season. Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact, given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered, EXNE)

As discussed in Section 3.8.4.1, Federally Listed and Candidate Species, the black-footed ferret is directly associated with prairie dog colonies and requires active prairie dog colonies of suitable size and density to maintain viable population levels. Portions of Alternative I-A are located within a USFWS designated "non-essential experimental population area" (USFWS 1998a). This area encompasses portions of Sweetwater County, Wyoming, and all of Moffat County, Colorado and Uintah County, Utah. A NEP designation allows the USFWS considerable flexibility in managing reintroduced populations of endangered species. The ESA allows for treating NEP as "proposed species" under the Act (USFWS 1998b). However, according to the ESA Consultation Handbook (USFWS 1998c), "*a "non-essential experimental population" is not essential to the continued existence of the species*." Areas designated as NEP areas do not require black-footed ferret surveys, although the USFWS encourages project applicants to protect all white-tailed prairie dog towns for their value to the prairie ecosystem and the myriad of species that rely on them.

Between 2001 and 2006, 217 black-footed ferrets were released within the Wolf Creek Management Area (WCMA) along Alternative I-A in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, a plague outbreak was detected. Results of spotlight surveys in 2010 were limted to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (CPW 2011).

The following analysis focused primarily on white-tailed prairie dog colonies and complexes that occur under Alternative I-A in areas that may require surveys for black-footed ferrets (i.e., areas outside the NEP area; **Figure 3.8-2**).

If black-footed ferrets are present within the Region I black-footed ferret analysis area, both direct and indirect impacts may occur as a result of surface-disturbing activities associated with construction of the proposed Project. Direct impacts to black-footed ferrets as a result of surface disturbance to white-tailed prairie dog colonies (**Table 3.8-25**) would include habitat loss, habitat fragmentation, animal displacement, and direct mortality associated with crushing of prairie dog burrows and vehicle collisions. Habitat fragmentation limits the dispersal of individual prairie dogs and increases the density of individuals within each smaller colony (Johnson and Collinge 2004). Higher densities within colonies may lead to increased incidence of sylvatic plague or canine distemper in black-footed ferret populations. Disease outbreaks may lead to the direct loss of individuals or entire populations. Indirect impacts would include increased noise and human activity associated with both construction and maintenance during operation. Increased human activity during construction and operation, as well as increased public access, may increase the prevalence of domestic dogs in construction areas. The presence of domestic dogs and raccoons could expose ferrets in the Region I black-footed ferret analysis area to diseases that could exterminate an entire population.

In contrast to the impacts mentioned above, certain surface-disturbing activities (e.g., blading/grading vegetation for pads, roads, ancillary facilities) may actually improve white-tailed prairie dog potential habitat and therefore possibly benefit black-footed ferrets. Decreasing vegetation cover creates open areas suitable for white-tailed prairie dog colonization, while subsequent re-vegetation increases forage for white-tailed prairie dogs. As prairie dogs increase the colony size, black-footed ferret potential habitat is increased. Potential direct impacts to black-footed ferrets, if present, would include the construction and operation disturbance of approximately 150 acres and 42 acres, respectively, of potentially suitable habitat. These areas represent 0.06 percent and 0.02 percent, respectively, of potentially suitable habitat within the Region I black-footed ferret analysis area.

Impacts to black-footed ferrets, if present, from operation of Alternative I-A would include disturbance from increased noise and human activity associated with maintenance during operation. Further impacts to black-footed ferrets may include a reduction of prey populations resulting from increased perching opportunity for raptors and corvids. Increased human activity during operation may increase the prevalence of domestic dogs and raccoons in work areas. The presence of domestic dogs and raccoons could expose ferrets in the Region I black-footed ferret analysis area to canine distemper and sylvatic plague. Disease outbreaks may lead to the direct loss of individuals or entire populations.

Based on the USFWS Black-footed Ferret 1989 Survey Guidelines, habitat evaluation for black-footed ferrets would include all white-tailed prairie dog colonies or complexes that have a burrow density of eight burrows per acre or greater (USFWS 1989). In addition, pre-construction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-A. If black-footed ferret surveys are required, consultation with the USFWS would be initiated prior to surveys being conducted. These surveys would take place no more than one year prior to construction activities. If black-footed ferrets are identified, no disturbance would occur within the white-tailed prairie dog complex and all Project-related activities in such colonies or complexes would be suspended immediately. The USFWS would be notified within 24 hours if a black-footed ferret or its sign was observed. If black-footed ferrets were detected, additional consultation with the USFWS would be required and the Project would be modified to avoid impacts to the species.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Table 3.8-25 Summary of Region I Alternative Route Impact Parameters for Federally Listed and Candidate Species

Species	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	150	42	17,475	232	55	23,997	79	22	9,565	180	46	19,879
Percentage of existing habitat within the Region I black-footed ferret analysis area	0.06	0.02	6.83	0.09	0.02	9.37	0.03	<0.01	3.74	0.07	0.02	7.77
Greater Sage-grouse potential habitat (acres)	1,034	280	100,984	991	251	123,480	1,611	415	155,726	991	251	123,480
Percentage of existing habitat within the Region I greater sage-grouse analysis area	0.03	<0.01	3.32	0.03	<0.01	4.06	0.05	0.01	5.12	0.03	<0.01	4.06
Western yellow-billed cuckoo potential habitat (acres)	43	4	1,398	46	4	1,554	41	5	2,932	39	3	1,524
Percentage of existing habitat within the Region I western yellow-billed cuckoo analysis area	0.09	<0.01	2.92	0.10	<0.01	3.25	0.09	0.01	6.13	0.08	<0.01	3.18
Gray wolf potential habitat (acres)	5,125	507	205,758	5,205	477	227,030	5,575	531	208,800	5,597	511	245,592
Percentage of existing habitat within the Region I special status wildlife analysis area	0.10	0.01	4.11	0.10	<0.01	4.54	0.11	0.01	4.18	0.11	0.01	4.91

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The gray wolf is a habitat generalist and the species is rare throughout its range in the Rocky Mountain region. Habitat requirements primarily are related to the density of prey species in the area. The gray wolf potentially could utilize any habitat type present in Region I, except for heavily managed agricultural lands. If gray wolves are present within the Region I special status wildlife analysis area, both direct and indirect impacts may occur as a result of construction of the proposed Project. Direct impacts to gray wolves would include loss of foraging or denning habitat, habitat fragmentation, animal displacement (both wolf and prey species), and direct mortality from vehicle collisions.

Alternative I-A would result in the construction and operation disturbance of 5,125 acres and 507 acres, respectively, of potential gray wolf foraging and denning habitat, and the incremental increase of habitat fragmentation associated with vegetation removal. These areas represent 0.10 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Impacts would be more pronounced within occupied habitat. Habitat fragmentation disrupts the movements of large mammal prey species and foraging gray wolves. Indirect impacts would include increased noise and human activity associated with both construction and maintenance activities during operation. Indirect impacts would occur to 205,758 acres, which represent 4.11 percent of gray wolf potential habitat within the Region I special status wildlife analysis area. Further indirect impacts to the gray wolf may include a reduction or change in distribution of large mammal populations. Impacts to the gray wolf under Alternative I-A would be limited primarily to habitat loss and fragmentation.

A summary of habitat impacts to federally listed and candidate species in Region I is found in **Table 3.8-25**.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur Region I are presented in **Table 3.8-26**. The types of direct and indirect impacts from construction and operation of Alternative I-A to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-A (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-A would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures, based on survey results. Additionally, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance and would vary by habitat type. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Table 3.8-26 BLM Sensitive and State-protected Species Potentially Occurring in Region I

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals – Bats	
Big brown bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
California myotis	Aspen forest and woodland, coniferous forest, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Agricultural land, aspen forest and woodland, coniferous forest, grassland, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, woody riparian and wetlands
Long-eared myotis	Agricultural land, aspen forest and woodland, cliff and canyon, coniferous forest, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Aspen forest and woodland, coniferous forest, herbaceous wetland, montane shrubland, open water, pinyon/juniper, riparian, saltbush shrubland, woody riparian and wetlands
Pallid bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, grassland, greasewood flat, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Agricultural land, aspen forest and woodland, coniferous forest, greasewood flat, herbaceous wetland, open water, pinyon/juniper, riparian, sagebrush shrubland, woody riparian and wetlands
Spotted bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Aspen forest and woodland, coniferous forest, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Aspen forest and woodland, cliff and canyon, coniferous forest, herbaceous wetland, open water, pinyon/juniper, riparian, saltbush shrubland
Western red bat	Agricultural land, deciduous forest, herbaceous wetland, open water, riparian, woody riparian and wetlands
Western small-footed myotis	Barren/sparsely vegetated, cliff and canyon, coniferous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, riparian, woody riparian and wetlands
Yuma myotis	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, deciduous forest, grassland, greasewood flat, herbaceous wetland, montane shrubland, open water, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Mammals – Other	
Fisher	Aspen forest and woodland, coniferous forest
Idaho pocket gopher	Grassland, montane grassland, montane shrubland, sagebrush shrubland
Pygmy rabbit	Sagebrush shrubland
River otter	Open water, riparian, woody riparian and wetlands
Rocky Mountain bighorn sheep	Cliff and canyon, coniferous forest, montane grassland, montane shrubland
Swift fox	Agricultural land, barren/sparsely vegetated, grassland, sagebrush shrubland
White-tailed prairie dog	Barren/sparsely vegetated, grassland, greasewood flat, montane grassland, sagebrush shrubland, saltbush shrubland
Wolverine	Coniferous forest
Wyoming pocket gopher	Barren/sparsely vegetated, greasewood flat, saltbush shrubland
Birds	
American white pelican	Open water
Least bittern	Herbaceous wetland
White-faced ibis	Agricultural land, herbaceous wetland, open water
Trumpeter swan	Herbaceous wetland, open water

Table 3.8-26 BLM Sensitive and State-protected Species Potentially Occurring in Region I

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Barrow's goldeneye	Herbaceous wetland, open water, woody riparian and wetlands
Bald eagle	Open water, woody riparian and wetlands
Northern goshawk	Aspen forest and woodland, coniferous forest
Swainson's hawk	Agricultural land, barren/sparsely vegetated, grassland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Ferruginous hawk	Cliff and canyon, grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Golden eagle	Agricultural land, cliff and canyon, grassland, pinyon/juniper, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Peregrine falcon	Aspen forest and woodland, cliff and canyon, coniferous forest, grassland, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Cliff and canyon, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Columbian sharp-tailed grouse	Grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, sagebrush shrubland, woody riparian and wetlands
Mountain plover	Agricultural land, barren/sparsely vegetated, grassland, montane grassland
Long-billed curlew	Agricultural land, grassland, herbaceous wetland, woody riparian and wetlands
Black tern	Open water, herbaceous wetland
Flammulated owl	Aspen forest and woodland, coniferous forest
Burrowing owl	Agricultural land, barren/sparsely vegetated, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Long-eared owl	Agricultural land, aspen forest and woodland, coniferous forest, grassland, montane grassland, pinyon/juniper, riparian, saltbush shrubland, woody riparian and wetlands
Short-eared owl	Agricultural land, grassland, greasewood flat, herbaceous wetland, montane grassland, sagebrush shrubland
Boreal owl	Aspen forest and woodland, coniferous forest
Black swift	Cliff and canyon, open water, woody riparian and wetlands
Lewis' woodpecker	Aspen forest and woodland, coniferous forest, pinyon/juniper, woody riparian and wetlands
Red-naped sapsucker	Aspen forest and woodland, coniferous forest, woody riparian and wetlands
American three-toed woodpecker	Coniferous forest
Loggerhead shrike	Agricultural land, grassland, greasewood flat, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Gray vireo	Montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Pinyon jay	Coniferous forest, montane shrubland, pinyon/juniper
Juniper titmouse	Pinyon/juniper
Sage thrasher	Sagebrush shrubland
Yellow-breasted chat	Riparian, woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, montane grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Grasshopper sparrow	Agricultural land, grassland, montane grassland, sagebrush shrubland
Bobolink	Agricultural land, grassland, herbaceous wetland
Reptiles	
Corn snake	Agricultural land, grassland, greasewood flat, herbaceous wetland, riparian, woody riparian and wetlands
Long-nosed leopard lizard	Barren/sparsely vegetated, greasewood flat, sagebrush shrubland, saltbush shrubland
Midget faded rattlesnake	Cliff and canyon, coniferous forest, greasewood flat, pinyon/juniper, montane shrubland, sagebrush shrubland, saltbush shrubland
Smooth greensnake	Agricultural land, aspen forest and woodland, coniferous forest, grassland, greasewood flat, herbaceous wetland,

Table 3.8-26 BLM Sensitive and State-protected Species Potentially Occurring in Region I

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
	montane grassland, riparian, woody riparian and wetlands
Terrestrial Invertebrates	
Great Basin silverspot (Nokomis fritillary butterfly)	Agricultural land, herbaceous wetland, riparian, woody riparian and wetlands

Alternative I-B

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two candidate species, 63 BLM sensitive and state-protected species. Species-specific impact discussions are presented below. No suitable habitat for the Canada lynx occurs along Alternative I-B; therefore, impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-B.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-20**, a total of 40 occupied/active leks occur within 4 miles of Alternative I-B (i.e., 28 occupied leks in Wyoming and 12 active leks in Colorado). In addition, Alternative I-B crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

The types of impacts to greater sage-grouse under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. The intensity of impacts to greater sage-grouse would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-20**). Analysis of lek attendance and productivity across alternatives is provided in **Table 3.8-22**. A summary of Wyoming and Colorado lek attendance data shows only minor differences in the average male sage-grouse lek attendance between Alternative I-A and I-B.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Nonetheless, given the amount of greater sage-grouse potential habitat crossed by the proposed Project under Alternative I-B (**Table 3.8-21**), operation would result in potential mortality of individuals and avoidance of sagebrush habitats within the transmission line corridor by local greater sage-grouse populations.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

The types of impacts to the whooping crane, interior least tern, and piping plover under Alternative I-B would be the same as described for Alternative I-A. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species

would not occur and TWE would not be required to conduct section 7 consultations with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

The types of impacts to the western yellow-billed cuckoo under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-B would result in the construction and operation disturbance of 46 acres and 4 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.10 percent and <0.01 percent, respectively, of the available suitable habitat within the Region I western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The types of impacts to black-footed ferrets under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-B would result in the construction and operation disturbance of 232 acres and 55 acres, respectively, of white-tailed prairie dog colonies. These areas represent 0.09 percent and 0.02 percent, respectively, of the available white-tailed prairie dog colonies within the Region I black-footed ferret analysis area.

Between 2001 and 2006, 217 black-footed ferrets were released within the WCMA along Alternative I-B in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, a plague outbreak was detected. Results of spotlight surveys in 2010 were limited to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (BLM 2012).

Preconstruction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-B. While habitat modifications may still occur, these surveys would be conducted to minimize direct impacts to black-footed ferrets.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use

of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors and black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-B would result in the construction and operation disturbance of 5,205 acres and 477 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.10 percent and <0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 227,030 acres, which represents 4.54 percent of gray wolf potential habitat within the Region I special status wildlife analysis area.

Impacts to the gray wolf under Alternative I-B would be limited primarily to habitat loss and fragmentation. Further indirect impacts to the gray wolf may include a reduction or change in distribution of large mammal populations.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative I-B in Region I are presented in **Table 3.8-26**. The types of impacts under Alternative I-B to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-B (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-B would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures, based on survey results. In addition, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project.

<u>Alternative I-C</u>

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two federal candidate species, 63 BLM sensitive and state-protected species. Species-specific impact discussions are presented below. No suitable habitat for the Canada lynx occurs along Alternative I-C; therefore, impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-C.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-20**, a total of 59 occupied/active leks occur within 4 miles of Alternative I-C (i.e., 38 occupied leks in Wyoming and 21 active leks in Colorado). In addition, Alternative I-C crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

The types of impacts to greater sage-grouse from under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-20**). Potential impacts to sage-grouse under Alternative I-C will be greater in comparison to Alternative I-A due to the increased number of leks located within 4 miles of the Project reference line and the total number of individual greater sage-grouse observed attending these leks. Although data regarding greater sage-grouse lek attendance in Colorado has not been received in time for inclusion in this draft, a summary of Wyoming lek attendance data shows that average lek attendance across Alternative I-C is similar to that of Alternative I-A (**Table 3.8-22**). The inclusion of Colorado sage-grouse lek attendance data will be required to provide a full comparison of potential impacts to sage-grouse populations across Region I alternatives.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Nonetheless, given the amount of greater sage-grouse habitat crossed by the proposed Project under Alternative I-C (**Table 3.8-21**), operation would result in potential mortality of individuals and avoidance of sagebrush habitats within the transmission line corridor by local greater sage-grouse populations.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

The types of impacts to the whooping crane, interior least tern, and piping plover under Alternative I-C would be the same as described for Alternative I-A.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur and TWE would not be required to conduct section 7 consultations with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

The types of impacts to the western yellow-billed cuckoo under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-C would result in the construction and operation disturbance of 41 acres and 5 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.09 percent and 0.01 percent, respectively, of the available suitable habitat within the Region I western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The types of impacts to the black-footed ferret under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-C would result in the construction and operation disturbance of 79 acres and 22 acres, respectively, of white-tailed prairie dog colonies. These areas represent 0.03 percent and <0.01 percent, respectively, of the white-tailed prairie dog colonies within the Region I black-footed ferret analysis area.

Between 2001 and 2006, 217 black-footed ferrets were released within the WCMA along Alternative I-C in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, an outbreak of the plague was detected. Results of spotlight surveys in 2010 were limited to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (BLM 2012).

Preconstruction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-C. While habitat modifications may still occur, these surveys would be conducted to minimize direct impacts to black-footed ferrets.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-C would result in the construction and operation disturbance of 5,575 acres and 531 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.11 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 208,800 acres, which represents 4.18 percent of gray wolf potential habitat within the Region I special status wildlife analysis area. Impacts to the gray wolf under Alternative I-C would be limited primarily to habitat loss and fragmentation.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur in Region I are presented in **Table 3.8-26**. The types of impacts under Alternative I-C to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-C (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-C would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures based on survey results. In addition, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative I-D (Agency Preferred)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two candidate species, 63 BLM sensitive and state-protected species. No suitable habitat for the Canada lynx occurs along Alternative I-D; therefore, impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. Species-specific impact discussions are presented below. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-D.

Greater sage-grouse

As presented in **Table 3.8-20**, a total of 47 occupied/active leks occur within 4 miles of Alternative I-D (i.e., 35 occupied leks in Wyoming and 12 active leks in Colorado). In addition, Alternative I-D crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

The types of impacts to the greater sage-grouse under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-20**). Potential impacts to greater sage-grouse from construction and operation of Alternative I-D may be higher in comparison to Alternative I-A, due to the greater number of leks located within 4 miles of the Project reference line. A summary of Wyoming and Colorado lek attendance data shows that average lek attendance across Alternative I-D is greater than that of Alternative I-A (**Table 3.8-22**). The inclusion of Colorado greater sage-grouse lek attendance data will be required to provide a full comparison of potential impacts to greater sage-grouse populations across Region I alternatives.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Nonetheless, given the amount of greater sage-grouse potential habitat crossed by the proposed Project under Alternative I-D (**Table 3.8-21**), operation would result in potential mortality of individuals and avoidance of sagebrush habitats within the 2-mile transmission line corridor by local greater sage-grouse populations.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

The types of impacts to the whooping crane, interior least tern, and piping plover under Alternative I-D would be the same as described for Alternative I-A.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur and TWE would not be required to conduct section 7 consultations with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

The types of impacts to the western yellow-billed cuckoo under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-D would result in the construction and operation disturbance of 39 acres and 3 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.08 percent and <0.01 percent, respectively, of the available suitable habitat within the Region I western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-D would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The types of impacts to the black-footed ferret under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-D would result in the construction and operation of 180 acres and 46 acres, respectively, of white-tailed prairie dog colonies. These areas represent 0.07 percent and 0.02 percent, respectively, of the available white-tailed prairie dog colonies within the Region I black-footed ferret analysis area.

Between 2001 and 2006, 217 black-footed ferrets were released within the WCMA along Alternative I-D in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, an outbreak of the plague was detected. Results of spotlight surveys in 2010 were limited to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (BLM 2012).

Preconstruction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-D. While habitat modifications may still occur, results of these surveys would be used to avoid and minimize direct impacts to black-footed ferrets.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-D would result in the construction and operation disturbance of 5,597 acres and 511 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.11 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 245,592 acres, which represents 4.91 percent of gray wolf potential habitat within the Region I special status wildlife analysis area. Impacts to the gray wolf under Alternative I-D would be limited primarily to habitat loss and fragmentation.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur in Region I are presented in **Table 3.8-26**. The types of impacts under Alternative I-D to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-D (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-D would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures based on survey results. In addition, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-D, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

TWE has developed three potential options to avoid or minimize the crossing of the Tuttle Easement and the National Park Service Deerlodge Road along Alternative I-D. These are referred to as Tuttle Easement micro-siting options 1, 2, and 3. CPW holds a conservation easement over portions of the Tuttle Ranch, located east of the town of Elk Springs in Moffat County, Colorado. The Tuttle Ranch supports an important white-tailed prairie dog colony, which is suitable habitat for the black-footed ferret. It is intended that future black-footed ferret reintroductions will occur within this conservation easement.

In terms of potential impacts to suitable black-footed ferret habitat and active white-tailed prairie dog colonies, micro-siting options 2 and 3 would result in the less potential impacts in comparison to Alternative I-D as both options avoid crossing these resources and the conservation easement altogether (**Table 3.8-27**). Although micro-siting option 1 would cross the conservation easement and suitable habitat for black-footed ferret reintroduction, this option would be constructed adjacent to an existing 345-kV transmission line, therefore impacts to special status wildlife species from habitat fragmentation would be reduced in comparison to Alternative I-D. The differences in potential impact acreages to greater sage-grouse habitat and active leks from the three micro-siting options are negligible as all three options would impact a similar number of acres of greater sage-grouse habitat and are located similar distances from the nearest active lek.

Table 3.8-27 Summary of Region I Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Parameter	Tuttle Easement Micro-siting Option 1			Tuttle Easement Micro-siting Option 2			Tuttle Easement Micro-siting Option 3			Comparison – Tuttle Easement Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	65	19	12,647	65	19	12,647	65	19	12,647	80	23	12,647
Percentage of existing habitat within the Region I black-footed ferret analysis area	0.03	0.01	4.94	0.03	0.01	4.94	0.03	0.01	4.94	0.03	0.01	4.94
Greater Sage-grouse potential habitat (acres)	688	178	88,909	688	178	88,909	688	177	88,909	685	176	88,909
Percentage of existing habitat within the Region I greater sage-grouse analysis area	0.02	<0.01	2.93	0.02	<0.01	2.93	0.02	<0.01	2.93	0.02	<0.01	2.93
Western yellow-billed cuckoo potential habitat (acres)	<1	<1	15	<1	<1	15	<1	<1	15	<1	<1	15

Table 3.8-27 Summary of Region I Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Parameter	Tuttle Easement Micro-siting Option 1			Tuttle Easement Micro-siting Option 2			Tuttle Easement Micro-siting Option 3			Comparison – Tuttle Easement Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Percentage of existing habitat within the Region I western yellow-billed cuckoo analysis area	<0.01	<0.01	0.03	<0.01	<0.01	0.03	<0.01	<0.01	0.03	<0.01	<0.01	0.03
Gray wolf potential habitat (acres)	1,727	174	86,923	1,712	173	86,923	1,727	174	86,923	1,723	173	86,923
Percentage of existing habitat within the Region I special status wildlife analysis area	0.03	<0.01	1.74	0.03	<0.01	1.74	0.03	<0.01	1.74	0.03	<0.01	1.74

Alternative Connectors in Region I

Both the Mexican Flats and Baggs alternative connectors would include minimal increases of total disturbance to special status wildlife species habitat, if they were to be utilized. Impacts associated with these connectors would be very similar to the other alternatives in Region I and would include minor disturbance to special status wildlife species habitat. **Table 3.8-28** summarizes impacts associated with the alternative connectors in Region I.

Table 3.8-28 Summary of Region I Alternative Connector Impact Parameters for Special Status Wildlife Species[1]

Alternative Connector	Impact Parameters
Mexican Flats Alternative Connector	• Approximately 10 miles in length.[2] • Not within Wyoming greater sage-grouse core areas. • Five greater sage-grouse leks within 4 miles of the reference line. • Within two black-footed ferret non block-cleared areas (Dad and Desolation Flats). • Eleven special status raptor species nests and 3 raptor nests of unknown species are within 1 mile of the reference line.
Baggs Alternative Connector	• Approximately 22 miles in length. • Not within Wyoming greater sage-grouse core areas. • Five greater sage-grouse leks within 4 miles of the reference line. • Not within black-footed ferret non block-cleared areas. • Eleven special status raptor species nests and 31 nests of unknown species are within 1 mile of the reference line.
Fivemile Point North Alternative Connector	• Approximately 3 miles in length. • Not within Wyoming greater sage-grouse core areas. • Three greater sage-grouse leks within 4 miles of the reference line. • Not within black-footed ferret non block-cleared areas. • Twelve special status raptor species nests and 6 nests of unknown species are within 1 mile of the reference line.
Fivemile Point South Alternative Connector	• Approximately 2 miles in length. • Not within Wyoming greater sage-grouse core areas. • One greater sage-grouse lek within 4 miles of the reference line. • Not within black-footed ferret non block-cleared areas. • Two special status raptor species nests and 1 nest of unknown species are within 1 mile of the reference line.

[1] Nests of raptor species, which are not classified as special status are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the Northern Terminal as discussed in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The special status wildlife species impacts associated with constructing and operating this system are the same as discussed for Alternative I-A.

Table 3.8-29 summarizes impacts associated with the seven combinations of alternative route and location possibilities for the northern ground electrode system.

Table 3.8-29 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Special Status Wildlife Species

Alternative Ground Electrode System Locations	Habitat Disturbance (acres)		Analysis
	Construction	Operation	
Separation Flat – All Alt. Routes	128	39	Due to the programmatic nature of the seven potential ground electrode systems, the extent of impacts to special status wildlife species is not known at this time. However, due to the potential locations occurring in southern Wyoming, impacts are expected to be the same as discussed in Section 3.8.6.1, Impacts to Special Status Wildlife Species from Terminal Construction and Operation, and Section 3.8.6.2, Impacts to Special Status Wildlife Species Common to All Alternative Routes and Associated Components. To reduce impacts to special status wildlife species, species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFWS, and applicable state wildlife agencies.
Shell Creek (Alt. I-A, I-D)	223	89	
Shell Creek (Alt I-B)	216	77	
Little Snake East (Alts I-A, I-B, I-D)	108	29	
Little Snake West (Alt. I-A)	121	37	
Little Snake West (Alt. I-B, I-D)	93	21	
Cottonwood Creek (Alt. I-C)	89	19	
Eight Mile Basin	83	17	
Separation Creek	136	47	

Table 3.8-30 summarizes the potential impacts to sagebrush habitats associated with the seven combinations of alternative route and location possibilities in Region I.

Table 3.8-30 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Greater Sage-grouse

Alternative Ground Electrode System Locations	Sagebrush Habitat Disturbance (acres)	
	Construction	Operation
Separation Flat (All Alt. Routes)	108	33
Shell Creek (Alt. I-A, I-D)	124	49
Shell Creek (Alt. I-B)	119	43
Little Snake East (Alt. I-A, I-B, and I-D)	106	29
Little Snake West (Alt. I-A)	104	31
Little Snake West (Alt. I-B and I-D)	79	18
Cottonwood Creek (Alt. I-C)	78	17
Eight Mile Basin	61	12
Separation Creek	129	45

Table 3.8-31 presents special status raptor nests known to occur within 1 mile of the reference line, site, and siting area at alternative ground electrode system locations.

Table 3.8-31 Special Status Raptor Nests Within 1 Mile of the Reference Line, Site, and Siting Area at Alternative Ground Electrode System Locations[1]

Alternative Ground Electrode System Locations[2]	Special Status Raptor Nests[3]
Separation Flat (All Alternatives)	One burrowing owl, 33 ferruginous hawk, 6 golden eagle, 3 prairie falcon, and 3 unknown raptor species nests
Shell Creek (Alternatives I-A, I-B, and I-D)	One burrowing owl, 28 ferruginous hawk, 18 golden eagle, 2 prairie falcon, and one unknown raptor species nests
Little Snake East (Alternatives I-A, I-B, and I-D)	One bald eagle, 10 ferruginous hawk, 1 golden eagle, and 5 unknown raptor species nests
Little Snake West (Alternatives I-A, I-B, and I-D)	Two burrowing owl, 5 ferruginous hawk, 14 golden eagle, 2 prairie falcon, and 27 unknown raptor species
Eight Mile Basin (All Alternatives)	Three ferruginous hawk, 2 golden eagle, and 1 prairie falcon nests
Separation Creek (All Alternatives)	Seventy-five ferruginous hawk, 17 golden eagle, 10 prairie falcon, and 3 unknown raptor species nests

[1] Raptor nests are a total of those within 1 mile of the reference line, site, and siting area. Some duplication exists due to the unknown exact locations of electrode sites and associated features.

[2] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[3] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

Region I Conclusion

A comparison of impact parameters for Region I alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-25**. Alternative I-C would result in the greatest direct and indirect impacts to greater sage-grouse potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). Alternative I-B would result in the greatest direct and indirect impacts to western yellow-billed cuckoo potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). Alternative I-B would result in the greatest direct and indirect impacts to black-footed ferret potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). Alternative I-D would result in the greatest direct and indirect impacts to gray wolf potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). The greatest level of impacts to special status wildlife species among all Region I alternatives associated with Alternative I-C is due to greater impacts to greater sage-grouse leks and potential habitat. However, Project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation.

3.8.6.5 Region II

Tables 3.8-32, **3.8-33, 3.8-34**, **3.8-35**, and **3.8-36** provide a tabulation of impacts associated with the alternative routes in Region II. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below. **Table 3.8-37** presents impacts to USFS sensitive species habitat on NFS lands that are crossed by route alternatives, or other Project components in Region II.

Table 3.8-32 Summary of Region II Alternative Route Impact Parameters for Greater Sage-grouse

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Colorado						
Number of occupied leks within 0.5 mile of reference lines	0	0	0	0	0	0
Number of occupied leks within 1 mile of reference lines	0	0	0	0	0	0
Number of occupied leks within 2 miles of reference lines	0	0	0	0	0	0
Number of occupied leks within 3 miles of reference lines	0	0	0	0	0	0
Number of occupied leks within 4 miles of reference lines	0	0	0	0	0	0
Number of occupied leks within 11 miles of reference lines	2	0	0	2	2	2
Utah						
Number of occupied leks within 0.5 mile of reference lines	2	0	0	0	0	0
Number of occupied leks within 1 mile of reference lines	3	0	0	3	1	3
Number of occupied leks within 2 miles of reference lines	4	0	0	7	7	10
Number of occupied leks within 3 miles of reference lines	7	0	0	10	9	13
Number of occupied leks within 4 miles of reference lines	7	0	0	10	10	15
Average distance of leks to reference line (Miles)	1.32	-	-	1.99	1.73	1.84
Number of occupied leks within 11 miles of reference lines	15	2	3	25	28	25
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	257	345	364	262	266	267

Habitat Disturbance	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Colorado PPH (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II greater sage-grouse analysis area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colorado PGH (acres)	247	62	24,545	178	45	14,389	178	45	14,389	248	62	24,622	248	62	24,622	248	62	24,622
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.15	0.04	14.81	0.11	0.03	8.68	0.11	0.03	8.68	0.15	0.04	14.86	0.15	0.04	14.86	0.15	0.04	14.86

Table 3.8-32 Summary of Region II Alternative Route Impact Parameters for Greater Sage-grouse

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
Utah nesting/brood-rearing habitat (acres)	856	241	83,719	170	59	10,541	0	0	0	633	174	52,573	830	210	73,699	375	107	25,785
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.06	0.02	6.03	0.01	<0.01	0.76	-	-	-	0.05	0.01	3.79	0.06	0.02	5.31	0.03	<0.01	1.86
Utah wintering habitat (acres)	676	191	64,643	139	48	8,707	0	0	0	597	161	50,936	856	216	70,837	397	108	27,984
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.07	0.02	6.52	0.02	<0.01	0.88	-	-	-	0.06	0.02	5.13	0.09	0.02	7.14	0.04	0.01	2.82
Utah occupied habitat[1]	885	253	87,487	264	95	16,489	16	4	1,089	907	262	72,919	991	256	88,248	413	117	30,215
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.05	0.02	5.12	0.02	<0.01	0.97	<0.01	<0.01	0.06	0.05	0.02	4.27	0.06	0.01	5.17	0.02	<0.01	1.77

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-33 Summary of Region II Greater Sage-grouse Attendance of Leks within 4 miles

Parameter[1]	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Colorado						
Number of active leks	0	0	0	0	0	0
Peak[2] male attendance combined 2003 – 2012	0	0	0	0	0	0
Minimum[3] male attendance combined 2003 – 2012	0	0	0	0	0	0
3-year average lek attendance[1]	0	0	0	0	0	0
Average attendance across all leks[4]	0	0	0	0	0	0
Total attendance 2003 - 2012	0	0	0	0	0	0
Number of leks with attendance 2008-2012	0	0	0	0	0	0
Survey effort[5,7]	100%	100%	100%	100%	100%	100%
Utah						
Number of active leks	7	0	0	10	10	15
Peak[2] male attendance combined 2003 – 2012	51	-	-	190	187	310
Minimum[3] male attendance combined 2003 – 2012	2	-	-	14	24	27
3-year average lek attendance[1]	4.86	-	-	6.33	8.07	7.69
Average attendance across all leks[4]	3.66	-	-	4.52	9.42	13.28
Total attendance 2003 - 2012	256	-	-	860	942	1328
Number of leks with no attendance 2008-2012[6]	4	-	-	1	3	1
Survey effort[5]	100%	100%	100%	100%	100%	100%

[1] Lek count numbers are male birds only, most recent data used.

[2] Sum of the 10 year peak annual counts from all leks within 4 miles combined (2002-2011).

[3] Sum of the 10 year minimum count from all leks within 4 miles combined (2002-2011).

[4] Total males observed/Number of surveys.

[5] Number of surveys/Number of potential surveys (10 years x 28 leks = 280 potential surveys).

[6] Although leks are classified as active or occupied, surveys have not observed male attendance over past 5 years.

[7] One historic lek occurs within 4 miles of the project reference line; annual surveys have not observed any breeding activity 2003-2012.

Table 3.8-34 Summary of Region II Alternate Route Impact Parameters (Visibility) for Greater Sage-grouse

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alterative II-D	Alternative II-E	Alternative II-F
Colorado						
Number of visible occupied leks within 0.5 mile of reference lines[1]	0	0	0	0	0	0
Number of visible occupied leks within 1 mile of reference lines	0	0	0	0	0	0
Number of visible occupied leks within 2 miles of reference lines	0	0	0	0	0	0
Number of visible occupied leks within 3 miles of reference lines	0	0	0	0	0	0
Number of visible occupied leks within 4 miles of reference lines	0	0	0	0	0	0
Average distance of visible leks within 4 miles of reference lines	0	0	0	0	0	0
Utah						
Number of visible occupied leks within 0.5 mile of reference lines	2	0	0	0	0	0
Number of visible occupied leks within 1 mile of reference lines	3	0	0	0	3	0
Number of visible occupied leks within 2 miles of reference lines	4	0	0	5	6	1
Number of visible occupied leks within 3 miles of reference lines	7	0	0	9	9	3
Number of visible occupied leks within 4 miles of reference lines	8	0	0	12	11	5
Average distance of visible leks within 4 miles of reference lines	1.72	-	-	2.34	1.88	2.70
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	257	345	364	262	266	267

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-35 Summary of Region II Alternative Route Impact Parameters for Utah Prairie Dog

Parameter	Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F	
	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact
Utah prairie dog colonies in high intensity survey areas (acres)[1]	0	0	0	0	179	33	0	0	0	0	0	0
Utah prairie dog colonies in low intensity survey areas (acres)[1]	0	0	0	0	86	14	0	0	0	0	0	0

[1] Acreages of Utah prairie dog colonies will be updated with 2013 survey results.

Table 3.8-36 Special Status Raptor Nests and Winter Roosts Within 1 Mile of the Reference Line in Region II[1]

Species[2]	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F	Castle Dale Alternative Connector	Price Alternative Connector	Lynndyl Alternative Connector	IPP East Alternative Connector	Cedar Knoll Micro-siting Option 1	Cedar Knoll Micro-siting Option 2	Comparable Portion of Alternative II-F	Emma Park Alternative Variation	Comparable Portion of Alternative II-F	Strawberry IRA Micro-siting Option 1	Strawberry IRA Micro-siting Option 2	Strawberry IRA Micro-siting Option 3	Strawberry IRA Comparable Portion of Alternative II-A	Highway 191 Alternative Connector	Cedar Knoll IRA Micro-siting Option 1	Cedar Knoll IRA Micro-siting Option 2	Cedar Knoll IRA comparable Portion of Alternative II-A
Northern goshawk	0	3	0	17	5	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern goshawk post-fledgling area	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ferruginous hawk	21	14	14	55	54	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden eagle	24	34	12	61	17	29	4	23	0	0	4	4	4	3	0	12	12	12	12	0	0	0	0
Peregrine falcon	0	2	0	3	0	3	2	3	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
Prairie falcon	4	1	1	5	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-eared owl	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Short-eared owl	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burrowing owl	0	3	3	21	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown raptor species[2]	80	95	91	87	77	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	129	154	124	250	156	200	6	30	0	0	5	5	5	3	0	12	12	12	12	0	0	0	0
Bald eagle winter roosts	6	0	0	2	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

[2] Nests of other special status raptor species such as bald eagle and Swainson's hawk are not included due to the lack of documented nest sites within 1 mile of the reference line.

Note: Bald eagle winter roosts are not considered in total.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
Ashley National Forest																						
1. Agricultural Land										0	0	0	0	0	0	**0**	**0**	**0**				2,691
2. Aspen Forest and Woodland										<1	<1	71	8	1	326	9	2	269				102,261
3. Barren/Sparsely Vegetated										0	0	0	0	0	0	0	0	0				136,429
4. Cliff and Canyon										4	1	330	12	4	2,241	4	1	330				39,266
5. Conifer Forest										<1	<1	2	39	6	2,206	20	5	566				543,194
6. Deciduous Forest										0	0	0	0	0	0	0	0	0				1,125
7. Desert Shrubland										0	0	0	0	0	0	0	0	0				0
8. Developed/Disturbed Land										1	<1	28	43	3	136	4	1	89				42,056
9. Dunes										0	0	0	0	0	0	0	0	0				23
10 Grassland										0	0	0	14	1	39	0	0	0				1,591
11. Greasewood Flat										0	0	0	0	0	0	0	0	0				1,891
12. Herbaceous Wetland										0	0	0	4	<1	70	0	0	0				28,424
13. Montane Grassland										1	<1	154	57	5	830	3	1	178				25,557
14. Montane Shrubland										<1	<1	24	3	<1	146	<1	<1	24				36,831
15. Open Water										0	0	0	0	0	0	0	0	0				21,383
16. Pinyon-juniper										4	2	698	85	15	6,204	4	2	698				104,031
17. Riparian										0	0	0	0	0	0	0	0	0				119
18. Sagebrush Shrubland										17	6	2,811	91	10	3,278	28	10	3,229				200,159
19. Saltbush Shrubland										<1	<1	26	1	<1	25	<1	<1	26				15,422
20. Tundra										0	0	0	0	0	0	0	0	0				17,639
21. Woody Riparian and Wetlands										0	0	0	<1	<1	1	<1	<1	<1				15,120
Fishlake National Forest																						
1. Agricultural Land	<1	<1	<1	0	0	0	<1	<1	38							0	0	0	0	0	0	623
2. Aspen Forest and Woodland	0	0	0	<1	<1	2	48	6	1,809							<1	<1	2	0	0	0	196,958
3. Barren/Sparsely Vegetated	0	0	0	0	0	0	6	1	246							0	0	0	0	0	0	11,977
4. Cliff and Canyon	0	0	0	<1	<1	33	6	2	731							<1	<1	33	<1	<1	3	38,891

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
5. Conifer Forest	0	0	0	0	0	0	51	6	1,535							0	0	0	0	0	0	224,021
6. Deciduous Forest	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	1
7. Desert Shrubland	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	121
8. Developed/Disturbed Land	<1	<1	<1	1	<1	69	20	3	950							1	<1	69	<1	<1	4	28,664
9. Dunes	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	0
10. Grassland	<1	<1	<1	14	2	548	12	1	408							14	2	548	1	<1	163	7,453
11. Greasewood Flat	0	0	0	0	0	0	0	0	0							0	0	0	<1	<1	5	306
12. Herbaceous Wetland	0	0	0	0	0	0	<1	<1	1							0	0	0	0	0	0	4,530
13. Montane Grassland	0	0	0	4	1	445	<1	<1	52							4	1	445	2	<1	102	9,129
14. Montane Shrubland	<1	<1	<1	<1	<1	10	178	25	8,961							<1	<1	10	<1	<1	11	211,109
15. Open Water	0	0	0	0	0	0	<1	<1	10							0	0	0	0	0	0	4,334
16. Pinyon-juniper	<1	<1	<1	95	10	2,254	466	54	18,613							95	10	2,254	9	1	554	426,154
17. Riparian	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	0
18. Sagebrush Shrubland	<1	<1	<1	19	3	769	218	22	7,022							19	3	769	3	<1	228	270,972
19. Saltbush Shrubland	0	0	0	<1	<1	6	3	<1	45							<1	<1	6	<1	<1	42	2,738
20. Tundra	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	7,664
21. Woody Riparian and Wetlands	0	0	0	0	0	0	12	2	489							0	0	0	<1	<1	2	8,234
Manti-La Sal National Forest																						
1. Agricultural Land	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				1,466
2. Aspen Forest and Woodland	2	<1	95	199	40	6,855				138	24	4,642	2	1	230	2	1	230				234,483
3. Barren/Sparsely Vegetated				3	<1	62				0	0	0	0	0	0	0	0	0				16,519
4. Cliff and Canyon	<1	<1	4	3	1	138				1	<1	2	1	<1	6	1	<1	6				43,352
5. Conifer Forest	3	2	470	185	36	6,269				66	13	2,590	3	2	537	3	2	537				289,618
6. Deciduous Forest	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				0
7. Desert Shrubland	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				1
8. Developed/Disturbed Land	2	<1	63	16	3	540				15	3	535	2	1	98	2	1	98				4,505
9. Dunes	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				0

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
10. Grassland	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				104
11. Greasewood Flat	0	0	0	<1	<1	1				0	0	0	0	0	0	0	0	0				80
12. Herbaceous Wetland	<1	<1	1	6	1	124				1	<1	55	<1	<1	2	<1	<1	2				2,789
13. Montane Grassland	0	0	0	35	7	1,104				2	1	170	0	0	0	0	0	0				26,225
14. Montane Shrubland	62	12	2,047	50	8	1,420				30	6	1,183	73	14	2,372	73	14	2,372				230,868
15. Open Water				<1	<1	19				<1	<1	13	0	0	0	0	0	0				2,282
16. Pinyon-juniper	48	9	1,575	57	9	1,387				4	<1	47	51	10	1,609	51	10	1,609				265,022
17. Riparian	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				0
18. Sagebrush Shrubland	4	1	82	138	26	4,361				76	11	1,909	4	1	89	4	1	89				192,203
19. Saltbush Shrubland	0	0	0	5	<1	18				0	0	0	0	0	0	0	0	0				2,814
20. Tundra	0	0	0	23	3	345				1	<1	2	0	0	0	0	0	0				18,793
21. Woody Riparian and Wetlands	1	<1	3	<1	<1	12				<1	<1	12	1	<1	3	1	<1	3				6,028
Uinta-Wasatch-Cache National Forest																						
1. Agricultural Land	<1	<1	13							<1	<1	1	<1	<1	1	<1	<1	1				290
2. Aspen Forest and Woodland	193	21	5,356							0	0	0	3	2	450	16	4	587				231,663
3. Barren/Sparsely Vegetated	0	0	0							0	0	0	2	1	104	2	1	104				11,182
4. Cliff and Canyon	3	1	402							<1	<1	1	3	<1	61	3	<1	65				25,335
5. Conifer Forest	63	10	3,460							0	0	0	4	1	245	13	3	358				114,549
6. Deciduous Forest	32	3	882							0	0	0	<1	<1	23	<1	<1	23				28,171
7. Desert Shrubland	0	0	0							0	0	0	0	0	0	0	0	0				0
8. Developed/Disturbed Land	18	2	550							<1	<1	3	18	2	276	18	2	279				497
9. Dunes	0	0	0							0	0	0	0	0	0	0	0	0				0
10. Grassland	<1	<1	73							0	0	0	<1	<1	30	<1	<1	30				3,211
11. Greasewood Flat	0	0	0							0	0	0	0	0	0	0	0	0				0
12. Herbaceous Wetland	3	<1	64							0	0	0	<1	<1	2	<1	<1	4				15,225
13. Montane Grassland	11	1	258							0	0	0	1	<1	37	1	<1	37				26,455
14. Montane Shrubland	70	12	3,170							<1	<1	17	40	10	1,915	64	13	2,158				168,362
15. Open Water	0	0	0							0	0	0	0	0	0	0	0	0				16,673
16. Pinyon-juniper	67	10	2,436							<1	<1	52	175	31	5,121	175	31	5,125				50,613

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
17. Riparian	0	0	0							0	0	0	0	0	0	0	0	0				0
18. Sagebrush Shrubland	178	25	7,534							<1	<1	13	67	12	2,107	78	14	2,292				187,523
19. Saltbush Shrubland	0	0	0							0	0	0	<1	<1	26	<1	<1	26				71
20. Tundra	0	0	0							0	0	0	0	0	0	0	0	0				57
21. Woody Riparian and Wetlands	2	<1	87							<1	<1	3	<1	<1	13	<1	<1	16				15,377

Alternative II-A (Applicant Proposed)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two candidate species, 65 BLM sensitive species, USFS sensitive species, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl and Utah prairie dog does not occur along Alternative II-A, therefore impacts are not expected to occur to these species. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-A.

Greater Sage-grouse (Candidate)

Greater sage-grouse in northeastern Utah along Alternative II-A are found primarily in Uintah, Duchesne, Wasatch, and Juab counties. These counties support several of the largest greater sage-grouse populations in Utah.

As presented in **Table 3.8-32**, a total of 7 active leks occur within 4 miles of Alternative II-A (i.e., 7 active leks in Utah). In addition, Alternative II-A crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-A generally would be the same as discussed for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-A crosses fewer leks with lower observed attendance rates in comparison to Alternatives II-D and II-E (**Tables 3.8-32** and **3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas for greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, occupied habitat, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. Nonetheless, given the amount of important greater sage-grouse habitat crossed by the proposed Project under Alternative II-A in northeastern Utah (**Table 3.8-32**), potential mortality from operation of the proposed Project is likely to be higher in comparison to Alternatives II-B and II-C. Potential impacts to greater sage-grouse resulting from operation of Alternative II-A are likely to be lower in comparison to Alternatives II-D and II-E.

Western Yellow-billed Cuckoo (Candidate)

Along Alternative II-A, extensive riparian habitat occurs at the confluence of the Duchesne, White, and Green rivers on the Uinta and Ouray Reservation (Grand and Uintah counties, Utah) (Bosworth 2003; Parrish et al. 2002) and sustains the largest breeding population of western yellow-billed cuckoos in Utah. This area is approximately 2 miles south of Alternative II-A. Additional habitat and documented occurrences of western yellow-billed cuckoos along Alternative II-A occurs in Utah County, Utah.

The types of impacts to the western yellow-billed cuckoo under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-A would result in the construction and operation disturbance of 90 acres and 12 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.08 percent and 0.01 percent, respectively, of the available potential habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting

western yellow-billed cuckoos under Alternative II-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXP/NE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado and Duchesne and Uintah counties, Utah, as NEP areas for black-footed ferrets. Alternative II-A is adjacent to the northern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ). The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that primarily inhabit the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-A would result in the construction and operation disturbance of 217 acres and 53 acres, respectively, of potentially suitable white-tailed prairie dog habitat in Uintah County, Utah. These areas represent 0.04 percent and 0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-A to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-A may indirectly impact black-footed ferrets that occur outside of the PMZ.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors and black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-A, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Uinta/Wasatch/Cache National Forest. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years. Impacts to the Canada lynx under Alternative II-A would include the construction and operation disturbance of 120 acres and 20 acres, respectively, of potential foraging and denning habitat and the incremental increase of habitat fragmentation from vegetation removal. These areas represent 0.03 percent and <0.01 percent, respectively, of coniferous forest habitat within the Region II special status wildlife analysis area (**Table 3.8-38**). Impacts would be more pronounced within occupied habitat. Impacts to habitat would include the loss of potential cover and den locations consisting of primarily large evergreen trees and downed woody debris. Loss of available foraging habitat (e.g., early succession high tree density areas preferred by the snowshoe hare) would result in impacts to Canada lynx. Indirect

Table 3.8-38 Summary of Region II Alternative Route Impact Parameters for Federally Listed and Candidate Species

	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	217	53	21,182	67	15	5,375	122	27	9,169	201	51	18,896	254	63	24,719	201	51	18,896
Percent of existing habitat within the Region II black-footed ferret analysis area	0.04	0.01	4.09	0.01	<0.01	1.04	0.02	<0.01	1.77	0.04	<0.01	3.65	0.05	0.01	4.78	0.04	<0.01	3.65
Greater sage-grouse potential habitat (acres)	2,664	747	260,404	750	248	50,126	195	49	15,478	2,385	659	201,050	2,924	744	257,407	1,432	388	108,606
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.12	0.03	11.29	0.03	0.01	2.17	<0.01	<0.01	0.67	0.10	0.03	8.71	0.13	0.03	11.16	0.06	0.02	4.71
Western yellow-billed cuckoo potential habitat (acres)	90	12	3,706	63	7	3,160	56	8	3,151	26	4	813	62	9	2,635	32	7	1,606
Percentage of existing habitat within the Region II western yellow-billed cuckoo analysis area	0.08	0.01	3.34	0.06	<0.01	2.85	0.05	<0.01	2.84	0.02	<0.01	0.73	0.06	<0.01	2.38	0.03	<0.01	1.45
Canada lynx potential habitat (acres)	120	20	5,730	287	54	10,541	63	9	3,543	243	43	9,291	158	26	6,735	418	91	12,572
Percentage of existing habitat within the Region II Canada lynx analysis area	0.03	<0.01	1.20	0.06	0.01	2.21	0.01	<0.01	0.74	0.05	<0.01	1.94	0.03	<0.01	1.41	0.09	0.02	2.63
Utah prairie dog potential habitat (acres)	0	0	0	0	0	0	179	33	18,730	0	0	0	0	0	0	0	0	0

Table 3.8-38 Summary of Region II Alternative Route Impact Parameters for Federally Listed and Candidate Species

	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Percentage of existing habitat within the Region II Utah prairie dog analysis area	0	0	0	0	0	0	0.03	<0.01	13.8	0	0	0	0	0	0	0	0	0
Gray wolf potential habitat (acres)	7,829	1,017	289,969	11,130	1,299	402,949	11,679	1,203	429,949	8,724	1,137	313,162	8,349	1,064	297,851	8,982	1,295	303,756
Percentage of existing habitat within the Region II special status wildlife analysis area	0.08	0.01	2.96	0.11	0.01	3.98	0.12	0.01	4.25	0.09	0.01	3.10	0.08	0.01	2.94	0.09	0.01	3.00

impacts would include increased noise and human activity associated with Project construction. Indirect impacts to Canada lynx would include increased noise and human presence associated with maintenance activities.

Canada lynx habitat along Alternative II-A is scarce and primarily occurs in the Uinta National Forest in higher elevation north and west facing slopes with dense forest canopies. Alternative II-A does not cross any LAUs in Utah. Therefore, impacts to Canada lynx under Alternative II-A would be limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

Impacts to the gray wolf under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-A would result in the construction and operation disturbance of 7,829 acres and 1,017 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.08 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 289,969 acres, which represents 2.96 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-A would be limited primarily to habitat loss and fragmentation.

Table 3.8-38 summarizes habitat impacts to federally listed species potentially occurring in Region II.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur in Region II are presented in **Table 3.8-39**. The types of impacts under Alternative II-A to BLM sensitive, USFS sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-A (e.g., sagebrush shrubland, pinyon-juniper, and montane shrubland) are more likely to be impacted under Alternative II-A. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Table 3.8-37 presents habitat acreage impacts by vegetation community/habitat type on USFS lands. Using **Table 3.8-37** in combination with the information presented in **Table 3.8-39**, habitat impacts for each species can be determined. For other sensitive species (BLM and state-protected), please refer to the corresponding vegetation community impacts tables in the Section 3.5, Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact to BLM sensitive, USFS sensitive, and state-protected species given the extent of native habitats in the surrounding Project region.

Table 3.8-39 BLM Sensitive and State-protected Species Potentially Occurring in Region II

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Big brown bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Big free-tailed bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Brazilian free-tailed bat	Aspen forest and woodland, coniferous forest, desert shrubland, herbaceous wetland, montane shrubland, open water, sagebrush shrubland, saltbush shrubland
California myotis	Aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Fringed myotis	Agricultural land, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-eared myotis	Agricultural land, aspen forest and woodland, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, herbaceous wetland, montane shrubland, open water, pinyon/juniper, saltbush shrubland, woody riparian and wetlands
Pallid bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, open water, pinyon/juniper, sagebrush shrubland, woody riparian and wetlands
Spotted bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Aspen forest and woodland, cliff and canyon, coniferous forest, desert shrubland, herbaceous wetland, open water, pinyon/juniper, saltbush shrubland
Western red bat	Agricultural land, deciduous forest, desert shrubland, herbaceous wetland, open water, woody riparian and wetlands
Western small-footed myotis	Barren/sparsely vegetated, cliff and canyon, coniferous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, woody riparian and wetlands

Table 3.8-39 BLM Sensitive and State-protected Species Potentially Occurring in Region II

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Yuma myotis	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane shrubland, open water, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Mammals - Other	
Dark kangaroo mouse	Desert shrubland, grassland, sagebrush shrubland, saltbush shrubland
Desert bighorn sheep	Cliff and canyon, desert shrubland, montane grassland
Fisher	Aspen forest and woodland, coniferous forest, deciduous forest
Kit fox	Agricultural land, barren/sparsely vegetated, desert shrubland, grassland, montane grassland, sagebrush shrubland, saltbush shrubland
Pygmy rabbit	Sagebrush shrubland
River otter	Open water, woody riparian and wetlands
Rocky Mountain bighorn sheep	Cliff and canyon, coniferous forest, montane grassland, montane shrubland, tundra
White-tailed prairie dog	Barren/sparsely vegetated, desert shrubland, grassland, greasewood flat, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Wolverine	Coniferous forest, tundra
Birds	
American white pelican	Open water
White-faced ibis	Agricultural land, herbaceous wetland, open water
Bald eagle	Open water, woody riparian and wetlands
Northern goshawk	Aspen forest and woodland, coniferous forest
Swainson's hawk	Agricultural land, barren/sparsely vegetated, desert shrubland, grassland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Ferruginous hawk	Cliff and canyon, desert shrubland, grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Golden eagle	Agricultural land, cliff and canyon, desert shrubland, grassland, pinyon/juniper, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland, tundra
Peregrine falcon	Aspen forest and woodland, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Cliff and canyon, desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Columbian sharp-tailed grouse	Grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, sagebrush shrubland, woody riparian and wetlands
Mountain plover	Agricultural land, barren/sparsely vegetated, grassland, montane grassland
Long-billed curlew	Agricultural land, grassland, herbaceous wetland, open water, woody riparian and wetlands
Black tern	Open water, herbaceous wetland
Flammulated owl	Aspen forest and woodland, coniferous forest
Burrowing owl	Agricultural land, barren/sparsely vegetated, desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland

Table 3.8-39 BLM Sensitive and State-protected Species Potentially Occurring in Region II

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Long-eared owl	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, grassland, montane grassland, pinyon/juniper, saltbush shrubland, woody riparian and wetlands
Short-eared owl	Agricultural land, grassland, greasewood flat, herbaceous wetland, montane grassland, sagebrush shrubland
Boreal owl	Aspen forest and woodland, coniferous forest
Black swift	Cliff and canyon, herbaceous wetland, open water, woody riparian and wetlands
Lewis' woodpecker	Aspen forest and woodland, coniferous forest, deciduous forest, pinyon/juniper, woody riparian and wetlands
Red-naped sapsucker	Aspen forest and woodland, coniferous forest, deciduous forest, woody riparian and wetlands
American three-toed woodpecker	Coniferous forest
Loggerhead shrike	Agricultural land, grassland, greasewood flat, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Gray vireo	Desert shrubland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Piñon jay	Coniferous forest, montane shrubland, pinyon/juniper
Juniper titmouse	Pinyon/juniper
Sage thrasher	Sagebrush shrubland
Bendire's thrasher	Desert shrubland, pinyon/juniper
Yellow-breasted chat	Woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, montane grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Bobolink	Agricultural land, grassland, herbaceous wetland
Reptiles	
Corn snake	Agricultural land, grassland, greasewood flat, herbaceous wetland, woody riparian and wetlands
Long-nosed leopard lizard	Barren/sparsely vegetated, desert shrubland, greasewood flat, sagebrush shrubland, saltbush shrubland
Midget faded rattlesnake	Cliff and canyon, coniferous forest, desert shrubland, greasewood flat, pinyon/juniper, montane shrubland, sagebrush shrubland, saltbush shrubland
Smooth greensnake	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, woody riparian and wetlands
Utah milk snake	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Terrestrial Invertebrates	
Eureka mountains	Barren/sparsely vegetated, cliff and canyon, desert shrubland, grassland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Great Basin silverspot (Nokomis fritillary butterfly)	Agricultural land, herbaceous wetland, woody riparian and wetlands

Strawberry IRA Micro-siting Options

TWE has developed three potential options to avoid or minimize the crossing of national forest IRAs along Alternative II-A. These are referred to as Strawberry Park micro-siting options 1, 2, and 3. These three micro-siting options would result in similar direct impacts to special status wildlife species habitat in comparison to Alternative II-A as shown in **Table 3.8-40**. Micro-siting options 2 and 3 would reduce the amount of habitat fragmentation in comparison to Alternative II-A as they would be collocated adjacent to an existing 345kV transmission line for approximately 4 miles. Any other differences in impacts to special status wildlife habitat are anticipated to be negligible in comparison to Alternative II-A.

Alternative II-B

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Utah prairie dog does not occur along Alternative II-B; therefore, impacts are not expected to occur to this species. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-B.

Greater Sage-grouse (Candidate)

Greater sage-grouse distribution along Alternative II-B in Colorado is limited to a small area in Moffat County near Massadona and immediately south of U.S. Highway 40. Under Alternative II-B in Utah, greater sage-grouse are only found in very small areas of suitable habitat in western Emery County, western Sanpete County, and Juab County.

As presented in **Table 3.8-32**, no active leks occur within 4 miles of Alternative II-B. However, Alternative II-B crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-32**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat that may help reduce potential raptor and corvid predation on greater sage-grouse. Given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-B (**Table 3.8-32**), potential impacts from operation of the proposed Project would be limited primarily to habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Eastern Uintah County, Utah, along the Colorado/Utah border is the primary area of potential Mexican spotted owl habitat along Alternative II-B. However, the USFWS recently downgraded the habitat quality within 0.5 mile of Alternative II-B to unsuitable.

Due to the lack of suitable habitat along Alternative II-B, no impacts to this species are expected to occur.

Western Yellow-billed Cuckoo

The primary areas of potential occurrence for the western yellow-billed cuckoo along Alternative II-B are in Rio Blanco and Mesa counties, Colorado, and Grand County, Utah (USFWS 2011e).

The types of impacts to western yellow-billed cuckoo under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 63 acres and 7 acres,

respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.06 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXP/NE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-B is adjacent to the eastern boundary of the Coyote Basin Reintroduction PMZ. The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that inhabit primarily the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 67 acres and 15 acres, respectively, of potentially suitable white-tailed prairie dog habitat in Rio Blanco County, Colorado. These areas represent 0.01 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-B to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-B may indirectly impact black-footed ferrets that occur outside of the PMZ.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-B, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Manti-La Sal and Uinta National Forests. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

Table 3.8-40 Summary of Region II Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Species	Strawberry IRA Micro-siting Option 1			Strawberry IRA Micro-siting Option 2			Strawberry IRA Micro-siting Option 3			Comparable – Strawberry IRA Micro-siting Options			Cedar Knoll IRA Micro-siting Option 1			Cedar Knoll Micro-siting Option 2			Comparable – Cedar Knoll Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II black-footed ferret analysis area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater Sage-grouse potential habitat (acres)	1,112	356	109,018	1,112	356	109,018	1,111	356	109,018	1,107	355	109,018	10	7	1,533	10	7	1,533	10	7	1,533
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.05	0.02	4.73	0.05	0.02	4.73	0.05	0.02	4.73	0.05	0.02	4.73	<0.01	<0.01	0.07	<0.01	<0.01	0.07	<0.01	<0.01	0.07
Western yellow-billed cuckoo potential habitat (acres)	51	6	1,734	51	6	1,734	51	6	1,734	49	6	1,734	9	3	612	7	3	612	11	3	612
Percentage of existing habitat within the Region II western yellow-billed cuckoo analysis area	0.05	<0.01	1.56	0.05	<0.01	1.56	0.05	<0.01	1.56	0.04	<0.01	1.56	<0.01	<0.01	0.55	<0.01	<0.01	0.55	<0.01	<0.01	0.55
Canada lynx potential habitat (acres)	91	13	4,609	94	14	4,609	95	14	4,609	96	14	4,609	23	6	1,106	23	6	1,106	25	6	1,106
Percentage of existing habitat within the Region II Canada lynx analysis area	0.02	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table 3.8-40 Summary of Region II Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Species	Strawberry IRA Micro-siting Option 1			Strawberry IRA Micro-siting Option 2			Strawberry IRA Micro-siting Option 3			Comparable – Strawberry IRA Micro-siting Options			Cedar Knoll IRA Micro-siting Option 1			Cedar Knoll Micro-siting Option 2			Comparable – Cedar Knoll Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Utah prairie dog potential habitat (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II Utah prairie dog analysis area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray wolf potential habitat (acres)	2,251	298	95,284	2,250	298	95,284	2,249	298	95,284	2,254	299	95,284	1,042	212	36,705	1,042	212	36,705	1,034	211	36,705
Percentage of existing habitat within the Region II special status wildlife analysis area	0.02	<0.01	0.94	0.02	<0.01	0.94	0.02	<0.01	0.94	0.02	<0.01	0.94	0.01	<0.01	0.36	0.01	<0.01	0.36	0.01	<0.01	0.36

The types of impacts to the Canada lynx under Alternative II-B generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 287 acres and 54 acres, respectively, of potentially suitable habitat. These areas represent 0.06 percent and 0.01 percent, respectively, of the available Canada lynx habitat within the Region II special status wildlife analysis area.

Canada lynx habitat along Alternative II-B is scarce and primarily occurs in the Manti-La Sal and Uinta national forests. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-B does not cross any LAUs in Utah. Therefore, impacts to Canada lynx under Alternative II-B would be limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

Impacts to the gray wolf under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 11,130 acres and 1,299 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.11 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 402,949 acres, which represents 3.98 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-B would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur in Region II are presented in **Table 3.8-39**. The types of impacts under Alternative II-B to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-B (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region. Impacts would primarily be the result of habitat loss and fragmentation.

<u>Alternative II-C</u>

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-C.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, no active leks occur within 4 miles of Alternative II-C. However, Alternative II-C crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-32**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-C (**Table 3.8-32**), potential impacts would primarily be the result of habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Eastern Uintah County, Utah, along the Colorado/Utah border is the primary area of potential Mexican spotted owl habitat along Alternative II-C. However, the USFWS has recently downgraded the habitat quality within 0.5 mile of Alternative II-C to unsuitable.

Due to the lack of suitable habitat along Alternative II-C, no impacts to this species are expected to occur.

Western Yellow-billed Cuckoo (Candidate)

The primary areas of potential occurrence for western yellow-billed cuckoo along Alternative II-C are in Rio Blanco and Mesa counties, Colorado, and Grand County, Utah (USFWS 2011e).

The types of impacts to the western yellow-billed cuckoo under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 56 acres and 8 acres, respectively, of potentially suitable riparian and wetland habitats. These areas represent 0.05 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-C is located approximately 10 miles from the eastern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ). The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that inhabit primarily the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 122 acres and 27 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado.

These areas represent 0.02 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-C to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-C may indirectly impact black-footed ferrets that occur outside of the PMZ.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-C, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Fishlake National Forest. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx under Alternative II-C generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 63 acres and 9 acres, respectively, of potentially suitable habitat. These areas represent 0.01 percent and <0.01 percent, respectively, of suitable habitat within the Region II special status wildlife analysis area.

Canada lynx habitat along Alternative II-C is scarce and primarily occurs in the Fishlake National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-C does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of construction and operation under Alternative II-B would be limited primarily to habitat loss and fragmentation.

Utah Prairie Dog (Threatened)

Along Alternative II-C, the Utah prairie dog occurs in northern Sevier County, Utah. Alternative II-C also crosses a USFWS designated Utah Prairie Dog Recovery Unit.

The types of impacts to the Utah prairie dog may result in direct mortalities of individuals as a result of crushing from construction activities; vehicles and equipment; and from increased predation by raptors. Alternative II-C would result in the disturbance of potentially suitable habitat (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 179 acres and 33 acres, respectively, of potentially suitable habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of suitable habitat within the Region II Utah prairie dog analysis area. Additional impacts may result from increased habitat fragmentation, noxious weed invasion, and human activity and noise. Impacts to the Utah prairie dog may result from increased human activity and noise from maintenance.

***SSWS-7**: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.*

Effectiveness: **SSWS-7** would reduce impacts to Utah prairie dogs by potentially reducing habitat disturbance within occupied habitat (e.g., reroutes) and by limiting raptor predation on Utah prairie dogs (i.e., anti-perching devices within occupied habitat).

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line ROW by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to the Project construction. Additionally, **SSWS-7** would identify suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Impacts would primarily be the result of habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 11,679 acres and 1,203 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.12 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 429,949 acres, which represents 4.25 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-C would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-C in Region II are presented in **Table 3.8-39**. The types of impacts under Alternative II-C to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-C (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region. Impacts would primarily result from habitat loss and fragmentation.

Alternative II-D

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-D.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, 10 active leks occur in Utah within 4 miles of Alternative II-D. Alternative II-D crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-32**). In comparison to Alternative II- A, impacts to sage-grouse under Alternative II-D are likely to be higher because this alternative crosses three more leks within 4 miles that have demonstrated increased attendance rates between 2003 and 2012 (**Table 3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or to use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-D (**Table 3.8-32**), impacts would primarily be the result of habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Southern Duchesne County, Utah, along the southern border of the Ashley National Forest, is the primary area of potential Mexican spotted owl habitat along Alternative II-D. The types of impacts to the Mexican spotted owl under Alternative II-D generally would be the same as described for raptors and other migratory birds under Alternative II-A, but would differ in the amount of habitat disturbed. Under Alternative II-D, impacts to the Mexican spotted owl may occur as a result of the construction and operation disturbance of 8 acres and 2 acres, respectively, of potentially suitable coniferous forest habitat. These areas represent 0.02 percent and 0.01 percent, respectively, of suitable habitat within the Region II Mexican spotted owl analysis area.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to Mexican spotted owls. Remaining impacts to Mexican spotted owls would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of foraging habitat in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

The primary areas of potential western yellow-billed cuckoo occurrence along Alternative II-D are in Rio Blanco and Mesa counties, Colorado, and Grand County, Utah (USFWS 2011e).

The types of impacts to western yellow-billed cuckoo under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Under Alternative II-D, impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 26 acres and 4 acres, respectively, of potentially suitable woody riparian and

wetland habitats. These areas represent 0.02 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-D would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-D is located approximately 6 miles from the northern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ). The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that inhabit primarily the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-D would result in the construction and operation disturbance of 201 acres and 51 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado. These areas represent 0.04 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-D to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-D may indirectly impact black-footed ferrets that occur outside of the PMZ.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-D, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Manti-La Sal National Forest. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx under Alternative II-D generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-D would result in the construction and operation disturbance of 243 acres and 43 acres, respectively, of potentially

suitable habitat. These areas represent 0.05 percent and <0.01 percent, respectively, of suitable habitat within the Region II Canada lynx analysis area.

Canada lynx habitat along Alternative II-D is scarce and primarily occurs in the Manti-La Sal National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-D does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of Alternative II-D are limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-D would result in the construction and operation disturbance of 8,724 acres and 1,137 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.09 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 313,162 acres, which represents 3.10 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-D would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-D are presented in **Table 3.8-39**. The type s of impacts under Alternative II-D to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-D (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-D, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region. Impacts would primarily be the result of habitat loss and fragmentation.

<u>Alternative II-E</u>

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-E.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, 10 active leks occur in Utah within 4 miles of Alternative II-E. Alternative II-E crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-32**). In comparison to Alternative II-A, impacts to sage-grouse are likely to be higher

because Alternative II-E crosses 3 more leks within 4 miles that have demonstrated increased attendance rates between 2003 and 2012 (**Table 3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or to use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-E (**Table 3.8-32**), impacts primarily would be the result of habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

No suitable habitat for this species is located within the 2-mile project corridor of Alternative II-E. The nearest suitable habitat for is located approximately 7 miles to the southwest at the confluence of Dry and Argyle Canyons, 25 miles northeast of Price, Utah. The types of impacts to the Mexican spotted owl under Alternative II-E generally would be the same as described for raptors and other migratory birds under Alternative II-A, but would differ in the amount of habitat disturbed (Section 3.7.6.3).

Due to the lack of suitable habitat along Alternative II-E, impacts to this species are expected to be negligible. Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to Mexican spotted owls. Remaining impacts to Mexican spotted owls would be limited to temporary disturbance of potential foraging habitat.

Western Yellow-billed Cuckoo (Candidate)

The primary areas of potential western yellow-billed cuckoo occurrence along Alternative II-E are in Rio Blanco County, Colorado (USFWS 2011e).

The types of impacts to the western yellow-billed cuckoo under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Under Alternative II-E, impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 62 acres and 9 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.06 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-E would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-E is located approximately 6 miles from the northern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ).

The types of impacts to black-footed ferrets under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-E would result in the construction and operation disturbance of 254 acres and 63 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado. These areas represent 0.05 percent and 0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-E to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-E may indirectly impact black-footed ferrets that occur outside of the PMZ.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-E, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Unitah-Wasatch-Cache and Ashley national forests. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx under Alternative II-E generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-E would result in the construction and operation disturbance of 158 acres and 26 acres, respectively, of potentially suitable habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of suitable habitat within the Region II Canada lynx analysis area.

Canada lynx habitat along Alternative II-E is scarce and occurs primarily in the Fishlake National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-E does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of Alternative II-E are limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-E would result in the construction and operation disturbance of 8,349 acres and 1,064 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.08 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 297,851 acres, which represents 2.94 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-E would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-E are presented in **Table 3.8-39**. The types of impacts under Alternative II-E to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-E (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-E, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative II-F (Agency Preferred)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-F.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, 15 active leks occur in Utah within 4 miles of Alternative II-F. Alternative II-F crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse from Alternative II-F generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-32**). In comparison to Alternative II-A, impacts to greater sage-grouse are likely to be higher because Alternative II-F crosses 8 more leks within 4 miles that have demonstrated increased attendance rates between 2003 and 2012 (**Table 3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or to use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-F (**Table 3.8-32**), potential mortality from operation of the proposed Project is expected to be limited primarily to habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Southern Duchesne County, Utah, along the southern border of the Ashley National Forest, is the primary area of potential Mexican spotted owl habitat along Alternative II-F. The types of impacts to the Mexican spotted owl under Alternative II-F generally would be the same as described for raptors and other migratory birds under Alternative II-A, but would differ in the amount of habitat disturbed. Under

Alternative II-F, impacts to the Mexican spotted owl may occur as a result of the construction and operation disturbance of 8 acres and 2 acres, respectively, of potentially suitable coniferous forest habitat. These areas represent 0.021 percent and 0.005 percent, respectively, of suitable habitat within the Region II mexican spotted owl analysis area.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to Mexican spotted owls. Remaining impacts to Mexican spotted owls would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of foraging habitat in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

The primary area of potential western yellow-billed cuckoo occurrence along Alternative II-F is in Rio Blanco County, Colorado (USFWS 2011e).

The types of impacts to the western yellow-billed cuckoo from Alternative II-F generally would be the same as described for Alternative I-A (**Table 3.8-38**). Under Alternative II-F, impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation loss of 32 acres and 7 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.03 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts to the western yellow-billed cuckoo during the breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-F would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-F is located approximately 6 miles from the northern boundary of the Coyote Basin Reintroduction PMZ. The types of impacts to black-footed ferrets from Alternative II-F generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-F would result in the construction and operation disturbance of 201 acres and 51 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado. These areas represent 0.04 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-F to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-F may indirectly impact black-footed ferrets that occur outside of the PMZ.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-F, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Unitah-Wasatch-Cache and Ashley national forests. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx from Alternative II-F generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-F would result in the construction and operation disturbance of 418 acres and 91 acres, respectively, of potentially suitable habitat. These areas represent 0.09 percent and 0.02 percent, respectively, of suitable habitat within the Region II Canada lynx analysis area.

Canada lynx habitat under Alternative II-F is scarce and occurs primarily in the Fishlake National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-F does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of construction and operation under Alternative II-F are limited primarily to habitat loss and fragmentation.

Gray Wolf

The types of impacts to the gray wolf under Alternative II-F generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Impacts to gray wolves under Alternative II-F would occur as the result of the construction and operation disturbance of 8,982 acres and 1,295 acres, respectively, of potential denning and foraging habitat. These areas represent 0.09 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 303,756 acres, which represents 3.00 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf as a result of Alternative II-F are limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-F are presented in **Table 3.8-39**. The types of impacts under Alternative II-F to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-F (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-F, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Cedar Knoll IRA Micro-siting Options

TWE has developed two potential options to avoid or minimize the crossing of national forest IRAs along Alternatives II-E and II-F. These are referred to as Cedar Knoll micro-siting options 1 and 2. Both of these micro-siting options would result in similar acreages of direct impacts to special status species wildlife habitat in comparison to Alternatives II-E and II-F. However, both of these micro-siting options would be collocated adjacent to an existing 345-kV transmission line while Alternatives II-E and II-F would not be collocated with existing transmission in this area. This aspect of the micro-siting options would result in reduced habitat fragmentation in comparison to Alternatives II-E and II-F. All other differences in impacts to wildlife habitat are anticipated to be negligible in comparison to Alternatives II-E and II-F.

Alternative Variation in Region II

Emma Park Alternative Variation

Several routes have been developed in the Emma Park area north of Price, Utah, to avoid greater sage-grouse potential habitat. One route is aligned east-west and is analyzed as the Emma Park Alternative Variation. This variation and the comparable portion of Alternative II-F do not cross the Fishlake or Manti-La Sal national forests. **Table 3.8-41** summarizes Region II alternative variation impact parameters for special status wildlife species. The Emma Park Alternative Variation would result in direct impacts to approximately 149 acres of construction impacts and 55 acres of operation impacts to greater sage-grouse occupied habitat as shown in **Table 3.8-41**. Comparable segments of Alternative II-F would avoid impacts to greater sage-grouse habitat. The Emma Park Alternative variation would be located within 4 miles of 7 active greater sage-grouse leks while comparable segments of Alternative II-F would be located greater than 4 miles from any active leks.

Table 3.8-41 Summary of Region II Alternative Variation Impact Parameters for Federally Listed and Candidate Species

Species	Emma Park Alternative Variation			Comparable – Emma Park Alternative Variation		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	0	0	0	0	0	0
Percentage of existing habitat within the Region II black-footed ferret analysis area	0	0	0	0	0	0
Greater Sage-grouse potential habitat (acres)	149	55	8,975	0	0	0
Percentage of existing habitat within the Region II greater sage-grouse analysis area	<0.01	<0.01	0.39	0	0	0
Western yellow-billed cuckoo potential habitat (acres)	<1	<1	5	<1	<1	5
Percentage of existing habitat within the Region II western yellow-billed cuckoo analysis area	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Canada lynx potential habitat (acres)	63	15	2,992	358	79	9,788
Percentage of existing habitat within the Region II Canada lynx analysis area	0.01	<0.01	<0.01	0.07	0.02	0.02
Utah prairie dog potential habitat (acres)	0	0	0	0	0	0
Percentage of existing habitat within the Region II Utah prairie dog analysis area	0	0	0	0	0	0
Gray wolf potential habitat (acres)	1,242	214	35,514	1,182	234	27,323
Percentage of existing habitat within the Region II special status wildlife analysis area	0.01	<0.01	0.35	0.01	<0.01	0.27

Alternative Connectors in Region II

The Lynndyl, IPP East, and Castle Dale alternative connectors would increase the total special status wildlife species habitat disturbance, if they were to be utilized. These connectors do not cross greater sage-grouse habitat. The Price Alternative Connector does cross occupied greater sage-grouse habitat and would increase the total special status wildlife species habitat disturbance, if utilized. **Table 3.8-42** summarizes impacts associated with the alternative connectors in Region II.

Table 3.8-42 Summary of Region II Alternative Connector Impact Parameters for Special Status Wildlife Species

Alternative Connector	Analysis
Highway 191 Alternative Connector	• Approximately 5 miles in length.[1] • No special status raptor nests are within 1 mile of the reference line.
Lynndyl Alternative Connector (Alternatives II-B and II-C)	• Approximately 24 miles in length.[1] • No special status raptor nests are within 1 mile of the reference line.
IPP East Alternative Connector (Alternatives II-A and II-B)	• Approximately 3 miles in length.[1] • No special status raptor nests are within 1 mile of the reference line.
Castle Dale Alternative Connector	• Approximately 11 miles in length.[1] • Six special status raptor nests are within 1 mile of the reference line.
Price Alternative Connector	• Approximately 18 miles in length.[1] • Twenty-nine special status raptor nests are within 1 mile of the reference line.

[1] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Region II Conclusion

A comparison of impact parameters for Region II alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-38**. Alternative II-E would result in the greatest direct and indirect impacts to greater sage-grouse potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-A would result in the greatest direct and indirect impacts to Western yellow-billed cuckoo potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-C would result in the greatest direct and indirect impacts to Utah prairie dog and gray wolf potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-E would result in the greatest direct and indirect impacts to black-footed ferret potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-F would result in the greatest direct and indirect impacts to Canada lynx potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). The greatest level of impacts to special status wildlife species among all Region II alternatives associated with Alternative II-E is due to significantly greater impacts to greater sage-grouse and black-footed ferret potential habitat. However, project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term after applying BMPs, design features, and additional mitigation.

3.8.6.6 Region III

Tables 3.8-43, **3.8-44**, **3.8-45**, **3.8-46**, and **3.8-47** provide a tabulation of impacts associated with the alternative routes in Region III. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below. The Dixie National Forest is crossed by the Project in Region III. **Table 3.8-48** presents impacts to USFS sensitive species habitat on

Dixie National Forest lands, which are crossed by alternative routes and other project components in Region III.

Desert Tortoise (Threatened)

Potential impacts to the desert tortoise would result from incremental increases in habitat fragmentation caused by vegetation removal and other surface-disturbing activities associated with transmission line construction. Other direct impacts could occur as a result of mortality caused by construction equipment and support vehicles crushing individuals and destroying burrows. Long-term increases in vehicle traffic and human activity associated with operations also could have adverse effects on the desert tortoise.

The number of occupied greater sage-grouse leks visible from the reference lines and the average distance of occupied leks visible from the reference lines in Region III are presented in **Table 3.8-45**. There are no occupied leks visible from within 4 miles of the reference lines associated with either Alternative III-B or III-C. Alternative III-A would impact 1 occupied lek visible from the reference line. No impacts to greater sage-grouse leks are expected to occur under Alternatives III-B and III-C. Although Alternative III-A would impact 1 occupied lek, implementation of **SSWS-5** would limit raptor and corvid predation and impacts to greater sage-grouse visible from the reference line. Thus, impacts associated with this occupied lek are expected to be low magnitude. A summary of assumptions regarding the lek visibility analysis is located in Section 3.8.6.3 under the Region I discussion of impacts to greater sage-grouse.

These impacts would be more pronounced within occupied habitat and USFWS critical habitat. In most instances, suitable habitat adjacent to disturbed areas would continue to be available for use by this species. However, displacement would increase competition and could result in some local reductions in desert tortoise populations if adjacent habitats are at carrying capacity.

SSWS-4*: To avoid and minimize impacts to the desert tortoise and its habitat, TWE would conduct field surveys in identified desert tortoise habitat following approved USFWS protocols. TWE would coordinate with the BLM, Western, Boulder City, Clark County, Nevada, Bureau of Reclamation, and USFWS to implement appropriate mitigation measures during construction, including but not limited to, fencing, preconstruction surveys, and relocating desert tortoises.*

Effectiveness: The implementation of **SSWS-4** would avoid and minimize impacts to the desert tortoise in Region III by first identifying suitable and occupied habitat and then implementing appropriate mitigation measures in coordination with the BLM, Western, and USFWS.

Several factors would combine to help minimize impacts to the desert tortoise resulting from the construction of Region III alternatives routes. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to desert tortoises would be reduced because appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts to the desert tortoise resulting from the Region III alternative routes would be limited primarily to habitat loss and fragmentation.

Table 3.8-43 Summary of Region III Alternative Route Impact Parameters for Desert Tortoise

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
USFWS critical habitat (acres)	502	162	42,946	328	87	27,525	587	151	63,104
USFWS potential habitat (acres)	993	299	85,863	1,081	279	98,374	985	242	100,923
USGS habitat model ranking 0.6 and higher (acres)	1,173	358	101,342	1,035	266	93,547	965	236	97,575

Table 3.8-44 Summary of Region III Alternative Route Impact Parameters for Greater Sage-grouse

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
Number of active leks within 4 miles of reference lines in Utah	1			0			0		
Length of transmission line in miles (habitat fragmentation and collision potential)	276			285			308		
Habitat Disturbance	**Construction Impact**	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**
Utah occupied habitat (acres)[1]	115	24	16,756	0	0	0	0	0	0
Utah brood-rearing areas (acres)	115	24	16,749	0	0	0	0	0	0
Utah wintering habitat (acres)	115	24	16,721	0	0	0	0	0	0

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

Table 3.8-45 Summary of Region III Alternate Route Impact Parameters (Visibility) for Greater Sage-grouse

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Utah			
Number of visible occupied leks within 0.5 miles of reference lines[1]	0	0	0
Number of visible occupied leks within 1 mile of reference lines	0	0	0
Number of visible occupied leks within 2 miles of reference lines	0	0	0
Number of visible occupied leks within 3 miles of reference lines	0	0	0
Number of visible occupied leks within 4 miles of reference lines	1	0	0
Average distance of visible leks within 4 miles of reference lines	3.44	-	-
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	276	285	308

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-46 Summary of Region III Alternative Route Impact Parameters for Utah Prairie Dog

Parameter	Alternative III-A		Alternative III-B		Alternative III-C	
	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact
Utah prairie dog colonies in high intensity survey areas (acres)[1]	54	21	57	24	65	29
Utah prairie dog colonies in low intensity survey areas (acres)[1]	23	10	29	12	36	15

[1] Acreages of Utah prairie dog colonies will be updated with 2013 survey results.

Table 3.8-47 Special Status Raptor Nests and Winter Roosts Within 1 Mile of the Reference Line in Region III[1]

Species	Alternative III-A	Alternative III-B	Alternative III-C	Ox Valley East Alternative Variation	Ox Valley West Alternative Variation	Ox Valley Alternative Variation Comparable Portion of Alternative III-A	Pinto Alternative Variation	Pinto Alternative Variation Comparable Portion of Alternative III-A	Avon Alternative Connector	Moapa Alternative Connector
Burrowing owl	7	6	6	0	0	0	0	0	0	0
Ferruginous hawk	30	13	13	0	0	0	1	3	0	0
Golden eagle	16	16	18	0	0	0	2	0	0	0
Prairie falcon	7	5	6	0	0	0	0	1	0	0
Long-eared owl	1	0	0	0	0	0	0	0	0	0
Unknown raptor species	147	79	82	1	1	11	3	50	0	0
Totals	208	119	125	1	1	11	6	54	0	0

[1] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

[2] Nests of other special status raptor species such as bald eagle and Swainson's hawk are not included due to the lack of documented nest sites within 1 mile of the reference line.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-48 Summary of Region III Alternative Route Impacts to Vegetation Communities on USFS-Administered Lands

Vegetation Community/ Habitat Type	Alternative III-A			Ox Valley East			Ox Valley East Comparison			Ox Valley West			Ox Valley West Comparison			Pinto Variation			Pinto Variation Comparison			Total Acres of Vegetation Community/ Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
Dixie National Forest																						
1. Agricultural Land	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<1	<1	5	0	0	0	629
2. Aspen Forest and Woodland	<1	<1	11	5	1	90	<1	<1	85	5	1	78	<1	<1	11	<1	<1	17	<1	<1	11	196,825
3. Barren/ Sparsely Vegetated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,266
4. Cliff and Canyon	<1	<1	62	6	<1	36	<1	<1	30	6	<1	30	<1	<1	62	<1	<1	15	<1	<1	62	93,023
5. Conifer Forest	<1	<1	1	<1	<1	4	0	0	4	<1	<1	4	0	0	0	<1	<1	8	<1	<1	1	537,641
6. Deciduous Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Desert Shrubland	33	4	1,031	1	<1	4	2	1	7	1	<1	5	2	1	154	<1	<1	1	<1	<1	29	5,265
8. Developed/ Disturbed Land	10	1	225	6	1	0	9	1	142	5	1	78	9	1	185	14	1	231	8	1	191	26,479
9. Dunes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
10. Grassland	3	<1	50	2	1	149	2	<1	153	2	1	146	2	<1	25	4	<1	122	2	<1	28	2,010
11. Greasewood Flat	<1	<1	6	0	0	0	<1	<1	0	0	0	0	<1	<1	6	0	0	0	<1	<1	6	19
12. Herbaceous Wetland	<1	<1	3	0	0	0	<1	<1	0	0	0	0	<1	<1	3	<1	<1	2	<1	<1	<1	4,438
13. Montane Grassland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,854
14. Montane Shrubland	22	7	1,827	72	15	2,609	18	7	2,551	69	15	2,500	18	7	1,737	8	1	518	18	7	1,731	106,207
15. Open Water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,445
16. Pinyon-juniper	293	53	13,966	285	45	8,402	233	42	8,153	277	43	5,054	233	42	8,822	490	56	19,225	245	45	11,410	521,470
17. Riparian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18. Sagebrush Shrubland	251	33	6,419	194	30	5,107	210	29	4,840	196	31	3,790	210	29	5,373	215	20	5,009	235	31	5,666	315,223

Table 3.8-48 Summary of Region III Alternative Route Impacts to Vegetation Communities on USFS-Administered Lands

Vegetation Community/ Habitat Type	Alternative III-A			Ox Valley East			Ox Valley East Comparison			Ox Valley West			Ox Valley West Comparison			Pinto Variation			Pinto Variation Comparison			Total Acres of Vegetation Community/ Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
19. Saltbush Shrubland	<1	<1	8	0	0	0	<1	<1	0	0	0	0	<1	<1	8	<1	<1	11	<1	<1	8	497
20. Tundra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,504
21. Woody Riparian and Wetlands	5	1	213	8	3	547	5	1	540	8	3	526	5	1	197	1	<1	143	5	1	197	15,660

Alternative III-A (Applicant Proposed)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region III include 5 federally listed and 2 federal candidate species, 76 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl does not occur along Alternative III-A, therefore impacts are not expected to occur to this species. Section 3.7.6.4 presents a description of existing disturbance along Alternative III-A.

Desert Tortoise (Threatened)

The desert tortoise occurs along Alternative III-A in southern Washington County, Utah and Clark and Lincoln counties, Nevada. This species occurs exclusively within the Mojave Desert shrub community.

Potential impacts to the desert tortoise would include the disturbance of potentially suitable habitat and the incremental increase of habitat fragmentation from vegetation removal and other surface-disturbing activities (**Table 3.8-43**). Direct impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 993 acres and 299 acres, respectively, of potentially suitable habitat. These areas represent 0.07 percent and 0.02 percent, respectively, of suitable habitat within the Region III desert tortoise analysis area. Additional loss of habitat, especially undisturbed occupied habitat and USFWS-designated critical habitat would result in an incremental reduction in the amount of available habitat in the Region III desert tortoise analysis area. Mortality as a result of crushing and burying also may result from construction activities. In most instances, suitable habitat adjacent to disturbed areas would continue to be available for use by this species. However, displacement would increase competition and could result in some local reductions in desert tortoise populations if adjacent habitats are at carrying capacity. Potential impacts also could include burrow abandonment or loss of eggs or young.

Operation-related impacts to desert tortoises under Alternative III-A would include increased human presence and noise during maintenance activities, which may result in displacement. Increased vehicle traffic within occupied desert tortoise habitat may lead to mortalities as a result of crushing. Direct mortality could result from construction personnel or members of the public handling tortoises. Desert tortoises expel their water reserve as a defense mechanism and can die if they aren't able to access water and rehydrate quickly. Also, there is potential for increased public access along Project roads to contribute to the problem of members of the public bringing desert tortoises home for pets.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative III-A. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced as appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative III-A would be limited primarily to habitat loss and fragmentation.

California Condor (Endangered; EXNE)

Condors regularly forage, roost, and may even nest in southern Utah (Gorell et al. 2005). Based on their ability to travel up to 200 miles in a day (UDNR 2011), this species may be found along Alternative III-A. The current range of this population is centered on the Colorado River Basin in northern Arizona and southern Utah. Although condors often winter in Arizona, many condors from the southwestern population forage over Utah. They can travel back and forth between the Grand Canyon and Zion National Park in a single day. Condors commonly occur in Utah between April and November, but peak numbers usually occur from June through August.

Because the species has such a large range, direct impacts from construction activities associated with Alternative III-A to foraging habitat would include the construction and operation disturbance of 4,810 acres and 525 acres, respectively. These areas represent 0.16 percent and 0.02 percent,

respectively, of the Region III California condor analysis area. Condors are cavity-nesting birds and most nest sites have been found in caves, on rock ledges, or in tree cavities. Direct impacts to condor nesting habitat from construction activities are unlikely because the species nests in rugged, remote locations.

Direct impacts from operation of Alternative III-A to the California condor include the potential for collision and electrocution associated with transmission lines (AZGFD 2011; 2004; Snyder and Rea 1998; Terres 1980; USFWS 1996). Since 1995 there have been a total of seven transmission line-related California condor deaths in California and Arizona (VWS 2007). The California condor is a very large avian scavenger, with a wingspan of 9.5 feet and a weight of up to 25 pounds. Using thermal updrafts, condors can soar and glide up to 50 miles per hour. Therefore, condors have low maneuverability, which contributes to the potential for transmission line collision and electrocution. The potential for electrocution mortality to California condors warrants special consideration regarding adequate spacing of transmission equipment (APLIC 2006). The wingspan of a condor could exceed typical separation distances of electrical conductors and other and other energized equipment. California condors normally produce only a single egg every other year (AZGFD 2008). Because they have a low reproductive rate, populations can be impacted by even sporadic mortality (USFWS 1996).

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to the California condor. Remaining impacts to the California condor would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Greater Sage-grouse (Candidate)

Greater sage-grouse along Alternative III-A in southwestern Utah are found in portions of Beaver and Iron counties. These counties support the largest greater sage-grouse populations in southwestern Utah.

As presented in **Table 3.8-44**, 1 active lek occurs within 4 miles of Alternative III-A. Alternative III-A also crosses a variety of greater sage-grouse habitats in Utah (**Figure 3.8-5**).

The types of impacts to greater sage-grouse from construction and operation of Alternative III-A generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-44**). Impacts under Alternative III-A would include the construction and operation disturbance of 346 acres and 73 acres, respectively. These areas represent 0.03 percent and <0.01 percent, respectively, of the Region III greater sage-grouse analysis area.

Implementation of **ECO-1**, **ECO-4**, and **TWE-32** would require TWE to identify sensitive areas to the greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat that may help reduce potential raptor and corvid predation on greater sage-grouse. Given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative III-A (**Table 3.8-44**), potential impacts from operation of the proposed Project would be primarily limited to habitat loss and fragmentation.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat along the Muddy and Virgin rivers in southern Nevada along Alternative III-A.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation. Alternative III-A would result in the construction and operation disturbance of 22 acres and 3 acres, respectively, of potentially suitable wetland habitat. These areas represent 0.04 percent and

<0.01 percent, respectively, of suitable habitat within the Region III Yuma clapper rail analysis area (**Table 3.8-49**).

Improved access as a result of Project roads under Alternative III-A may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-A would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative III-A in several areas of southern Utah and Nevada. The western yellow-billed cuckoo is a confirmed breeder along the Muddy River in Clark County, Nevada (Floyd et al. 2007). Records also exist for the western yellow-billed cuckoo in the Beaver Dam Wash in Washington County, Utah (Bosworth 2003; Parrish et al. 2000).

The types of impacts to the western yellow-billed cuckoo under Alternative III-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Under Alternative III-A, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 22 acres and 3 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.04 percent and <0.01 percent, respectively, of suitable habitat within the Region III western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative III-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative III-A in southwestern Utah and southern Nevada. In the Nevada portion of the region, essential habitat for the species is identified on the Pahranagat River, the Muddy River, and a portion of the Virgin River. Designated Critical Habitat does not occur along Alternative III-A.

Direct impacts to the southwestern willow flycatcher include habitat loss, modification, and fragmentation. Under Alternative III-A, direct impacts to the southwestern willow flycatcher may occur as a result of the construction and operation disturbance of 22 acres and 3 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.04 percent and <0.01 percent, respectively, of suitable habitat within the Region III southwestern willow flycatcher analysis area (**Table 3.8-49**).

Table 3.8-49 Summary of Region III Alternative Route Impact Parameters for Federally Listed and Candidate Species

Species	Alternative III-A			Alternative III-B			Alternative III- C		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Desert tortoise potential habitat (acres)	993	299	85,863	1,081	279	98,374	985	242	100,923
Percentage of existing habitat within the Region III desert tortoise analysis area	0.07	0.02	5.72	0.07	0.02	6.56	0.07	0.02	6.72
Greater sage-grouse potential habitat (acres)	346	73	50,225	0	0	0	0	0	0
Percentage of existing habitat within the Region III greater sage-grouse analysis area	0.03	<0.01	4.21	0	0	0	0	0	0
Utah prairie dog potential habitat (acres)	52	11	1901	37	8	694	37	8	694
Percentage of existing habitat within the Region III Utah prairie dog analysis area	0.04	<0.01	1.40	0.03	<0.01	0.51	0.03	<0.01	0.51
California condor potential habitat (acres)	4,810	525	179,459	4,308	401	160,820	4,624	426	188,549
Percentage of existing habitat within the Region III California condor analysis area	0.16	0.02	4.74	0.14	0.01	5.26	0.15	0.01	6.17
Yuma clapper rail potential habitat (acres)	22	3	3,706	81	6	3,160	19	2	3,151
Percentage of existing habitat within the Region III Yuma clapper rail analysis area	0.04	<0.01	3.34	0.15	0.01	2.85	0.04	<0.01	2.84
Western yellow-billed cuckoo potential habitat (acres)	22	3	3,706	81	6	3,160	19	2	3,151
Percentage of existing habitat within the Region III western yellow-billed cuckoo analysis area	0.04	<0.01	3.34	0.15	0.01	2.85	0.04	<0.01	2.84
Southwestern willow flycatcher potential habitat (acres)	22	3	3,706	81	6	3,160	19	2	3,151
Percentage of existing habitat within the Region III southwestern willow flycatcher analysis area	0.04	<0.01	3.34	0.15	0.01	2.85	0.04	<0.01	2.84

Southwestern willow flycatchers will nest in native riparian habitat where available, but also will nest in monocultures of salt cedar or Russian olive (USGS 2008). Improved access as a result of Project roads may further fragment suitable habitat and result in increased disturbance to the species. These impacts would be more pronounced if construction were to occur during the southwestern willow flycatcher breeding season (March 15 to October 15).

SSWS-8*: To prevent impacts to southwestern willow flycatchers during the breeding season, TWE would avoid construction within suitable habitat from March 15 to October 15, or, alternatively, conduct breeding southwestern willow flycatcher surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*

Effectiveness: To minimize impacts to southwestern willow flycatchers during the breeding season (March 15 to October 15), TWE also has committed to implement seasonal timing restrictions in applicable areas (TWE-32). More specifically, **SSWS-8** would require TWE to avoid habitat removal, between March 15 and October 15 or, alternatively, conduct southwestern willow flycatcher surveys and implement appropriate mitigation in coordination with the BLM, Western, and state wildlife agencies.

Operation of the proposed Project would incrementally increase the collision potential for southwestern willow flycatchers. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of **TWE-32** and **SSWS-8** would avoid impacts during the breeding season. Remaining impacts to nesting southwestern willow flycatchers under Alternative III-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Utah Prairie Dog (Threatened)

Along Alternative III-A, the Utah prairie dog is found in Beaver, Iron, and Washington counties, Utah. Alternative III-A also crosses a USFWS-designated Utah Prairie Dog Recovery Unit.

The types of impacts to Utah prairie dogs under Alternative III-A generally would be the same as described for Alternative II-C, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Under Alternative III-A, direct impacts to the Utah prairie dog may occur as a result of the disturbance of potentially suitable habitat (**Table 3.8-46**). Impacts to the Utah prairie dog may occur as a result of the construction and operation disturbance of 52 acres and 11 acres, respectively, of potentially suitable habitat. These areas represent 0.04 percent and <0.01 percent, respectively, of suitable habitat within the Region III Utah prairie dog analysis area.

SSWS-7*: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.*

Effectiveness: **SSWS-7** would reduce impacts to Utah prairie dogs by potentially reducing habitat disturbance within occupied habitat (e.g., reroutes) and by limiting raptor predation on Utah prairie dogs (i.e., anti-perching devices within occupied habitat).

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line ROW by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to the Project construction. Additionally, **SSWS-7** would identify suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Therefore, impacts to the Utah prairie dog under Alternative III-A primarily would be limited to habitat loss and fragmentation.

Table 3.8-49 presents a summary of impacts to federally listed species that potentially occur within Region III.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur in Region III are presented in **Table 3.8-50**. The types of impacts under Alternative III-A to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative III-A (e.g., desert shrub, grassland, and sagebrush shrubland) are more likely to be impacted under Alternative III-A. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies. **Table 3.8-48** presents habitat acreage impacts by vegetation community/habitat type on USFS lands. Using **Table 3.8-48** in combination with the information presented in **Table 3.8-50**, habitat impacts for each species can be determined. For other sensitive species (BLM and State), please refer to the corresponding vegetation community impacts tables in the Section 3.5, Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing trampling acreages and the facilities acreages to determine construction disturbance, and using the operations numbers alone to understand acres of operations disturbance for each vegetation community/habitat type. **Table 3.8-49** summarizes habitat impacts to federally listed species potentially occurring in Region III.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS-sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative III-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

<u>Alternative III-B (Agency Preferred)</u>

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region III include six federally listed and two federal candidate species, 76 BLM sensitive species, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl does not occur along Alternative III-B; therefore, impacts are not expected to occur to this species. Alternative III-B does not occur within the known range of the California condor, therefore impacts to this species are not expected to occur. Section 3.7.6.5 presents a description of existing disturbance along Alternative III-B.

Table 3.8-50 BLM Sensitive and State-protected Species Potentially Occurring in Region III

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals – Bats	
Allen's big-eared bat	Desert shrubland, greasewood flat, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Big brown bat	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Big free-tailed bat	Desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Brazilian free-tailed bat	Desert shrubland, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland
California leaf-nosed bat	Desert shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
California myotis	Desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Cave myotis	Desert shrubland, montane grassland, riparian, woody riparian and wetlands
Fringed myotis	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-eared myotis	Desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Desert shrubland, herbaceous wetland, montane shrubland, riparian, saltbush shrubland, woody riparian and wetlands
Pallid bat	Desert shrubland, grassland, greasewood flat, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Desert shrubland, greasewood flat, herbaceous wetland, riparian, sagebrush shrubland, woody riparian and wetlands
Spotted bat	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland
Western red bat	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Western small-footed myotis	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, woody riparian and wetlands
Yuma myotis	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Mammals - Other	
Dark kangaroo mouse	Desert shrubland, grassland, sagebrush shrubland, saltbush shrubland
Desert bighorn sheep	Desert shrubland, montane grassland
Desert Valley kangaroo mouse	Desert shrubland, sagebrush shrubland, saltbush shrubland
Kit fox	Desert shrubland, grassland, montane grassland, sagebrush shrubland, saltbush shrubland
Pygmy rabbit	Sagebrush shrubland
Rocky Mountain bighorn sheep	Montane grassland, montane shrubland

Table 3.8-50 BLM Sensitive and State-protected Species Potentially Occurring in Region III

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Bald eagle	Woody riparian and wetlands
Swainson's hawk	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Ferruginous hawk	Desert shrubland, grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Golden eagle	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Peregrine falcon	Desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Long-billed curlew	Grassland, herbaceous wetland, woody riparian and wetlands
Burrowing owl	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Long-eared owl	Desert shrubland, grassland, montane grassland, riparian, saltbush shrubland, woody riparian and wetlands
Short-eared owl	Grassland, greasewood flat, herbaceous wetland, montane grassland, sagebrush shrubland
Lewis' woodpecker	Woody riparian and wetlands
Red-naped sapsucker	Woody riparian and wetlands
Loggerhead shrike	Grassland, greasewood flat, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Gray vireo	Desert shrubland, montane shrubland, sagebrush shrubland, saltbush shrubland
Piñon jay	Montane shrubland
Sage thrasher	Sagebrush shrubland
Bendire's thrasher	Desert shrubland
Crissal thrasher	Desert shrubland, sagebrush shrubland, saltbush shrubland,woody riparian and wetlands
Le Conte's thrasher	Desert shrubland, woody riparian and wetlands
Phainopepla	Desert shrubland, woody riparian and wetlands
Lucy's warbler	Woody riparian and wetlands
Yellow-breasted chat	Riparian, woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, montane grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Bobolink	Grassland, herbaceous wetland
Reptiles	
Banded Gila monster	Desert shrubland, grassland
Chuckwalla	Desert shrubland
Corn snake	Grassland, greasewood flat, herbaceous wetland, riparian, woody riparian and wetlands
Desert iguana	Desert shrubland, sagebrush shrubland, saltbush shrubland
Desert night lizard	Desert shrubland
Long-nosed leopard lizard	Desert shrubland, greasewood flat, sagebrush shrubland, saltbush shrubland
Mojave rattlesnake	Desert shrubland
Sidewinder	Desert shrubland
Speckled rattlesnake	Desert shrubland, sagebrush shrubland, saltbush shrubland

Table 3.8-50 BLM Sensitive and State-protected Species Potentially Occurring in Region III

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Western banded gecko	Desert shrubland, sagebrush shrubland, saltbush shrubland
Western red-tailed skink	Riparian, woody riparian and wetlands
Western threadsnake (blindsnake)	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Zebra-tailed lizard	Desert shrubland
Terrestrial Invertebrates	
Great Basin small blue (Small blue) butterfly	Desert shrubland, riparian, sagebrush shrubland, woody riparian and wetlands
Grey's silverspot (Grey's fritillary) butterfly	Grassland, montane grassland, montane shrubland
Honey Lake blue butterfly	Saltbush shrubland
MacNeill sooty wing skipper (MacNeill saltbush sootywing butterfly)	Herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Mojave gypsum bee	Desert shrubland, sagebrush shrubland
Mojave poppy bee	Desert shrubland, sagebrush shrubland
Mono basin skipper (Railroad Valley skipper) butterfly	Desert shrubland, grassland, montane grassland, sagebrush shrubland,
Northern Mojave blue (Mojave blue) butterfly	Desert shrubland, sagebrush shrubland
Rice's blue butterfly	Saltbush shrubland
White River wood nymph butterfly	Grassland, montane grassland, herbaceous wetland

Desert Tortoise (Threatened)

The desert tortoise is known to occur along Alternative III-B in Clark and Lincoln counties, Nevada. This species is found exclusively with the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative III-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-43**). Direct impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 1,081 acres and 279 acres, respectively, of potentially suitable habitat. These areas represent 0.07 percent and 0.02 percent, respectively, of potentially suitable habitat within the Region III desert tortoise analysis area.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative III-B. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to desert tortoises would be reduced because appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative III-B would be limited primarily to habitat loss and fragmentation.

California Condor (Endangered; EXNE)

California condors regularly forage, roost, and may even nest in southern Utah (Gorell et al. 2005). Based on their ability to travel up to 200 miles in a day (UDNR 2011), this species may be found along Alternative III-B.

Because the species has such a large range, direct impacts from construction activities associated with Alternative III-B to foraging habitat would include the construction and operation disturbance of 4,308 acres and 401 acres, respectively. These areas represent 0.14 percent and 0.01 percent, respectively, of the Region III California condor analysis area (**Table 3.8-49**). California condors are cavity-nesting birds and most nest sites have been found in caves, on rock ledges, or in tree cavities. Impacts to California condor nesting habitat from construction activities are unlikely because the species nests in rugged, remote locations.

The types of impacts from the operation of Alternative III-B to the California condor generally would be the same as described under Alternative III-A, but would differ in the amount of habitat disturbed.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to the California condor. Remaining impacts to the California condor would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Greater Sage-grouse (Candidate)

Greater sage-grouse in southwestern Utah along Alternative III-B occur in portions of Beaver and Iron counties. These counties support the largest greater sage-grouse populations in southwestern Utah.

The types of impacts to the greater sage-grouse under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. However, as presented in **Table 3.8-44**, no active leks or UDWR mapped greater sage-grouse habitat would be impacted by Alternative III-B.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to the greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Given the lack of greater sage-grouse habitat crossed by the proposed Project under Alternative III-B (**Table 3.8-44**), potential mortality from operation of the proposed Project would be primarily limited to habitat loss and fragmentation.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat along the Muddy and Virgin rivers in southern Nevada along Alternative III-B.

The types of impacts to the Yuma clapper rail under Alternative III-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-B would result in the construction and operation disturbance of 81 acres and 6 acres, respectively, of potentially suitable habitat. These areas represent 0.15 percent and 0.01 percent, respectively, of suitable habitat within the Region III Yuma clapper rail analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to the Yuma clapper rail under Alternative III-B would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative III-B in southern Nevada. The western yellow-billed cuckoo is a confirmed breeder along the Muddy River in Clark County, Nevada (Floyd et al. 2007).

The types of impacts to the western yellow-billed cuckoo under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Under Alternative III-B, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 81 acres and 6 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.15 percent and 0.01 percent, respectively, of suitable habitat within the Region III western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative III-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative III-B in southern Nevada. Essential habitat for the species is identified on the Pahranagat River, the Muddy River, and a portion of the Virgin River. Designated Critical Habitat does not occur along Alternative III-B, but does occur approximately 10 miles southeast at the Virgin River, contiguous with the essential habitat section and upstream to the Arizona border. Other potential suitable habitat for the southwestern willow flycatcher near Alternative III-B includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative III-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-B would result in the construction and operation disturbance of 81 acres and 6 acres, respectively, of potentially suitable habitat. These areas represent 0.15 percent and 0.01 percent, respectively, of potentially suitable habitat within the Region III southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative III-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Utah Prairie Dog (Threatened)

Along Alternative III-B, the Utah prairie dog is found in Beaver, Iron, and Washington counties, Utah. Alternative III-B also crosses a USFWS-designated Utah Prairie Dog Recovery Unit.

The types of impacts to Utah prairie dogs under Alternative III-B generally would be the same as described for Alternative II-C, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-B would result in the construction and operation disturbance of 37 acres and 8 acres, respectively, of potentially suitable grassland habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of potential habitat within the Region III Utah prairie dog analysis area.

***SSWS-7**: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.*

Effectiveness: **SSWS-7** would reduce impacts to Utah prairie dogs by potentially reducing habitat disturbance within occupied habitat (e.g., reroutes) and by limiting raptor predation on Utah prairie dogs (i.e., anti-perching devices within occupied habitat).

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line ROW by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to Project construction. In addition, **SSWS-7** would identify potentially suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Therefore, impacts to the Utah prairie dog under Alternative III-B would be primarily limited to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur under Alternative III-B are presented in **Table 3.8-50**. The types of impacts under Alternative III-B to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative III-B (e.g., desert shrub, sagebrush shrubland, saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative III-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative III-C

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted under Alternative III-C include 6 federally listed and 2 federal candidate species, and 76 BLM sensitive, USFS sensitive species, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl does not occur along Alternative III-C; therefore, impacts are not expected to occur to this species. Alternative III-C does not occur within the known range of the California condor; therefore, impacts to this species are not expected to occur. Section 3.7.6.5 presents a description of existing conditions along Alternative III-C.

Desert Tortoise (Threatened)

The desert tortoise occurs along Alternative III-C in Clark and Lincoln counties, Nevada. This species is found exclusively within the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative III-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-43**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 985 acres and 242 acres, respectively, of potentially suitable habitat. These areas represent 0.07 percent and 0.02 percent, respectively, of potentially suitable habitat within the Region III desert tortoise analysis area.

Several factors would combine to help minimize desert tortoise impacts as a result of Alternative III-C. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise potential habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced because appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative III-C would be limited primarily to habitat loss and fragmentation.

California Condor (Endangered; EXNE)

California condors regularly forage, roost, and may even nest in southern Utah (Gorell et al. 2005). Based on their ability to travel up to 200 miles in a day (UDNR 2011), this species may occur along Alternative III-C.

Because the species has such a large range, direct impacts under Alternative III-C to potential foraging habitat would include the construction and operation disturbance of 4,624 acres and 426 acres, respectively. These areas represent 0.15 percent and 0.01 percent, respectively, of the Region III California condor analysis area (**Table 3.8-49**). California condors are cavity-nesting birds and most nest sites have been found in caves, on rock ledges, or in tree cavities. Impacts to California condor nesting habitat from construction activities are unlikely because the species nests in rugged, remote locations.

The types of impacts from the operation of Alternative III-C to the California condor generally would be the same as described under Alternative III-A but would differ in the amount of habitat impacted.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to California condors. Remaining impacts to the California condor would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Greater Sage-grouse (Candidate)

Greater sage-grouse along Alternative III-C in southwestern Utah occur in portions of Beaver and Iron counties. These counties support the largest greater sage-grouse populations in southwestern Utah.

The types of impacts to the greater sage-grouse under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). However, as presented in **Table 3.8-44**, no active leks or UDWR mapped greater sage-grouse habitat would be impacted by Alternative III-C.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to the greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat that may help reduce potential raptor and corvid predation on greater sage-grouse. Given the lack of greater

sage-grouse habitat crossed by the proposed Project under Alternative III-C (**Table 3.8-44**), potential impacts from operation of the proposed Project would be limited primarily to habitat loss and fragmentation.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat along the Muddy and Virgin rivers in southern Nevada along Alternative III-C.

The types of impacts to the Yuma clapper rail under Alternative III-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-C would result in the construction and operation disturbance of 19 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 0.04 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region III Yuma clapper rail analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the breeding season. Remaining impacts to Yuma clapper rails under Alternative III-C would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative III-C in southern Nevada. The western yellow-billed cuckoo is a confirmed breeder along the Muddy River in Clark County, Nevada (Floyd et al. 2007).

The types of impacts to the western yellow-billed cuckoo under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Under Alternative III-C, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 19 acres and 2 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.04 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region III western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative III-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative III-C in southern Nevada. Essential habitat for the species is identified on the Pahranagat River. Designated Critical Habitat does not occur along Alternative III-C, but does occur approximately 10 miles southeast at the Virgin River, contiguous with the essential habitat section and upstream to the Arizona border. Other potential habitat that has been recognized as suitable for the southwestern willow flycatcher near Alternative III-C includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative III-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-C would result in the construction and operation disturbance of 19 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 0.04 percent and <0.01 percent,

respectively, of potentially suitable habitat within the Region III southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative III-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Utah Prairie Dog (Threatened)

Along Alternative III-C, the Utah prairie dog is found in Beaver, Iron, and Washington counties, Utah. Alternative III-C also crosses a USFWS designated Utah Prairie Dog Recovery Unit.

The types of impacts to Utah prairie dogs under Alternative III-C generally would be the same as described for Alternative II-C, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-C would result in the construction and operation disturbance of 37 acres and 8 acres, respectively, of potentially suitable grassland habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region III Utah prairie dog analysis area.

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to the Project construction. Additionally, **SSWS-7** would identify suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Therefore, impacts to the Utah prairie dog under Alternative III-C would be primarily limited to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative III-C are presented in **Table 3.8-50**. The types of impacts under Alternative III-C to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative III-C (e.g., desert shrub, sagebrush shrubland, saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative III-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative Variations in Region III

The types of impacts to special status wildlife species under the three alternative variations in Region III generally would be the same as the comparable portions of Alternatives III-A, but would differ in the amount of habitat disturbed (**Table 3.8-51**). No greater sage-grouse or desert tortoise habitat would be impacted by the alternative variations in Region III. Similar to the comparable portions of Alternative III-A, after considering design features and mitigation measures, impacts to special status wildlife species from Project construction and operation would be limited primarily to habitat loss and fragmentation.

Alternative Connectors in Region III

The Moapa and Avon alternative connectors would include minimal increases of total habitat disturbance if they were to be utilized. **Table 3.8-52** summarizes impacts associated with the alternative connectors in Region III.

Table 3.8-53 provides a comparison of alternative electrode bed locations proposed near the Southern Terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

No special status raptor nests are identified at Region III ground electrode sites. Data for this region is incomplete.

Region III Conclusion

A comparison of impact parameters for Region III alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-49**. Alternative III-A would result in the greatest direct and indirect impacts to greater sage-grouse potential habitat in comparison to the other Region III alternatives (**Table 3.8-44**). In addition, Alternatives III-B and III-C would result in no construction, operation, or indirect impacts to greater sage-grouse potential habitat, whereas Alternative III-A would result in 346 acres of construction impact, 73 acres of operation impact, and 50,225 acres of indirect impact to greater sage-grouse potential habitat. Alternative III-B would result in the greatest direct and indirect impacts to desert tortoise potential habitat in comparison to the other Region III alternatives (**Table 3.8-43**). Alternative III-B would result in the greatest direct and indirect impacts to Southwest willow flycatcher, Western yellow-billed cuckoo, and Yuma clapper rail potential habitat in comparison to the other Region III alternatives (**Table 3.8-49**). The greatest level of impacts to special status wildlife species among all Region III alternatives associated with Alternative III-A is due to greater impacts to greater sage-grouse habitat. However, project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term after applying BMPs, design features, and additional mitigation.

3.8.6.7 Region IV

Tables 3.8-54 and **3.8-55** provide a tabulation of impacts associated with the alternative routes in Region IV. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region IV include three federally listed and one federal candidate species, and 65 BLM sensitive, USFS sensitive species, and state-protected species. Species-specific impacts are discussed below. Suitable habitat for the Yuma clapper rail does not occur along Alternative IV-A, therefore impacts are not expected to occur to this subspecies. Section 3.7.6.6 presents a description of existing disturbance along Alternative IV-A.

Table 3.8-56 summarizes habitat impacts to federally listed species potentially occurring in Region IV.

Table 3.8-51 Summary of Impacts to Special Status Species Under Region III Alternative Variations[1]

Impact Parameters	Ox Valley East Alternative Variation		Comparable Portion of Alternative Route III-A		Ox Valley West Alternative Variation		Comparable Portion of Alternative III-A		Pinto Alternative Variation		Comparable Portion of Alternative Route III-A	
	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact
Special status wildlife species habitat (acres)	276	100	252	95	268	100	252	95	449	111	381	125
Length of transmission line (miles)	16		15		17		15		29		24	
Number of potential special status raptor species nests within 1 mile of the reference line[2]	1 unknown raptor species[2]		11 unknown raptor species[2]		1 unknown raptor species[2]		11 unknown raptor species[2]		2 golden eagle, 1 ferruginous hawk, 3 unknown raptor species[2]		50 unknown raptor species[2], 3 ferruginous hawk, 1 prairie falcon	

[1] Raptor nest data received for Utah is incomplete for this portion of Region III.

[2] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-52 Summary of Region III Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Moapa Alternative Connector	• Approximately 13 miles in length.[1] • Approximately 425 acres of construction and 34 acres of operation impacts to special status wildlife species habitat would occur. • No special status raptor nests are within 1 mile of the reference line. • No occupied greater sage-grouse habitat crossed by reference line
Avon Alternative Connector	• Approximately 8 miles in length.[1] • Approximately 104 acres of construction and 21 acres of operation impacts to special status wildlife species habitat would occur. • No special status raptor nests are within 1 mile of the reference line. • No occupied greater sage-grouse habitat crossed by reference line.

[1] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-53 Summary of Region III Alternative Ground Electrode System Location Impacts for Special Status Wildlife Species

Alternative Ground Electrode System Locations	Estimated Habitat Disturbance (acres)		Analysis
	Construction Impact	Operation Impact	
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	92	20	Due to the programmatic nature of the seven potential ground electrode systems, the extent of special status wildlife species impacts is not known at this time. However, due to the potential locations occurring in southern Nevada, impacts are expected to be the same as discussed in Section 3.8.6.1, Impacts from Terminal Construction and Operation, and Section 3.8.6.2, Impacts Common to All Alternative Routes and Associated Components. To reduce impacts to special status wildlife species, species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFWS, and applicable state wildlife agencies.
Mormon Mesa-Carp Elgin Rd (Alternative III-B)	103	26	
Halfway Wash- Virgin River (Alternative III-A)	84	15	
Halfway Wash- Virgin River (Alternative B)	92	20	
Halfway Wash East (Alternative III-A)	103	26	
Halfway Wash East (Alternative III-B)	102	25	
Meadow Valley 2 (Alternative III-C)	164	65	
Delta Ground Electrode (Design Option 2 and 3)	129	39	

Table 3.8-54 Summary of Region IV Alternative Route Impact Parameters for Desert Tortoise

Parameter	Alternative IV-A			Alternative IV-B			Alternative IV-C		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
USFWS critical habitat (acres)	0	0	0	0	0	0	172	22	8,298
USFWS potential habitat (acres)	738	566	38,679	802	553	37,454	877	172	60,862
USGS habitat model ranking 0.6 and higher (acres)	704	535	35,670	564	383	27,456	632	118	50,192

Table 3.8-55 Special Status Raptor Species Nests within 1 Mile of the Reference Line in Region IV

Species	Alternative IV-A	Alternative IV-B	Alternative IV-C	Marketplace Alternative Variation	Sunrise Mountain Alternative Connector	Lake Las Vegas Alternative Connector	Three Kids Mine Alternative Connector	River Mountain Alternative Connector	Railroad Pass Alternative Connector
Peregrine falcon	0	1	1	0	0	0	0	1	0
Prairie falcon	1	0	0	0	0	0	0	0	0
Total	1	1	1	0	0	0	0	1	0

[1] Total nests for Region I is not equal to a sum of alternate routes and other project components. This is due to the fact that nests could be present within 1 mile of the reference line or facility along multiple routes.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-56 Summary of Region IV Alternative Route Impact Parameters for Federally Listed and Candidate Species

Species	Alternative IV-A			Alternative IV-B			Alternative IV- C		
	Construction Impact	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**
Desert tortoise potential habitat (acres)	566	148	38,679	553	171	37,454	645	172	60,862
Percentage of existing habitat within the Region IV desert tortoise analysis area	0.12	0.03	8.03	0.11	0.04	7.78	0.13	0.04	12.63
Yuma clapper rail potential habitat (acres)	1	<1	2	12	2	240	12	2	242
Percentage of existing habitat within the Region IV Yuma clapper rail analysis area	0.06	<0.01	0.14	1.06	0.18	21.93	1.06	0.18	22.07
Western yellow-billed cuckoo potential habitat (acres)	1	<1	2	12	2	240	12	2	242
Percentage of existing habitat within the Region IV western yellow-billed cuckoo analysis area	0.06	<0.01	0.14	1.06	0.18	21.93	1.06	0.18	22.07
Southwestern willow flycatcher potential habitat (acres)	1	<1	2	12	2	240	12	2	242
Percentage of existing habitat within the Region IV southwestern willow flycatcher analysis area	0.06	<0.01	0.14	1.06	0.18	21.93	1.06	0.18	22.07

Desert Tortoise (Threatened)

The desert tortoise occurs along the entire length of Alternative IV-A (**Figure 3.8-6**). This species is found exclusively with the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative IV-A generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-54**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 566 acres and 148 acres, respectively, of potentially suitable habitat. These areas represent 0.12 percent and 0.03 percent, respectively, of potentially suitable habitat within the Region IV desert tortoise analysis area.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative IV-A (**Table 3.8-56**). Through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. By implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced through implementation of appropriate mitigation measures approved by the USFWS. Therefore, impacts under Alternative IV-A would be limited primarily to habitat loss and fragmentation.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative IV-A in southern Nevada in close proximity to perennial streams, wetlands, and lakes.

The types of impacts to the western yellow-billed cuckoo under Alternative IV-A generally would be the same as described for Alternative I-A. Under Alternative IV-A, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 1 acre and <1 acre, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.06 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region IV western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative IV-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative IV-A in southern Nevada. Potential suitable habitat for the southwestern willow flycatcher near Alternative IV-A includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative IV-A generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-56**). Alternative IV-A would result in the construction and operation disturbance of 1 acre and <1 acre, respectively, of potentially suitable habitat. These areas represent 0.06 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region IV southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative IV-A would be limited to temporary habitat disturbance.

This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat in southern Nevada along Alternative IV-A.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation (**Table 3.8-56**). Alternative IV-A would result in the construction and operation disturbance of 1 acre and <1 acre, respectively, of potentially suitable wetland habitat. These areas represent 0.06 percent and <0.01 percent, respectively, of suitable habitat within the Region IV Yuma clapper rail analysis area.

Improved access as a result of Project roads under Alternative IV-A may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-A would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative IV-A are presented in **Table 3.8-57**. The types of impacts under Alternative IV-A to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with desert shrubland are more likely to be impacted. Impacts to this habitat type are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, Western, and NDOW.

Table 3.8-57 BLM Sensitive and State-protected Species Potentially Occurring in Region IV

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals – Bats	
Allen's big-eared bat	Desert shrubland, riparian, saltbush shrubland, woody riparian and wetlands
Big brown bat	Barren/sparsely vegetated, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Big free-tailed bat	Barren/sparsely vegetated, cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Brazilian free-tailed bat	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland
California leaf-nosed bat	Desert shrubland, riparian, saltbush shrubland, woody riparian and wetlands
California myotis	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands

Table 3.8-57 BLM Sensitive and State-protected Species Potentially Occurring in Region IV

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Cave myotis	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Fringed myotis	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Greater western mastiff bat	Barren/sparsely vegetated, cliff and canyon, desert shrubland, riparian
Hoary bat	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Long-eared myotis	Cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Pallid bat	Barren/sparsely vegetated, desert shrubland, grassland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Spotted bat	Barren/sparsely vegetated, cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Desert shrubland, herbaceous wetland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland
Western red bat	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Western small-footed myotis	Barren/sparsely vegetated, cliff and canyon, desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Yuma myotis	Barren/sparsely vegetated, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Mammals – Other	
Dark kangaroo mouse	Desert shrubland
Desert bighorn sheep	Cliff and canyon, desert shrubland
Kit fox	Barren/sparsely vegetated, desert shrubland, saltbush shrubland
Pale kangaroo mouse	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Bald eagle	Woody riparian and wetlands
Swainson's hawk	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Ferruginous hawk	Cliff and canyon, desert shrubland, saltbush shrubland
Golden eagle	Cliff and canyon, desert shrubland, saltbush shrubland
Peregrine falcon	Cliff and canyon, desert shrubland, herbaceous wetland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Cliff and canyon, desert shrubland, saltbush shrubland
Western snowy plover	Barren/ sparsely vegetated, herbaceous wetland
Burrowing owl	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Long-eared owl	Desert shrubland, riparian, saltbush shrubland, woody riparian and wetlands
Red-naped sapsucker	Woody riparian and wetlands
Loggerhead shrike	Saltbush shrubland
Gray vireo	Cliff and canyon, desert shrubland, saltbush shrubland
Bendire's thrasher	Desert shrubland
Crissal thrasher	Desert shrubland, saltbush shrubland, woody riparian and wetlands
LeConte's thrasher	Desert shrubland, woody riparian and wetlands

Table 3.8-57 BLM Sensitive and State-protected Species Potentially Occurring in Region IV

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Phainopepla	Desert shrubland, woody riparian and wetlands
Lucy's warbler	Woody riparian and wetlands
Yellow-breasted chat	Riparian, woody riparian and wetlands
Reptiles	
Banded Gila monster	Barren/ sparsely vegetated, desert shrubland
Chuckwalla	Barren/ sparsely vegetated, desert shrubland
Desert glossy snake	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Desert iguana	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Desert night lizard	Barren/ sparsely vegetated, cliff and canyon, desert shrubland
Long-nosed leopard lizard	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Mojave rattlesnake	Desert shrubland
Mojave shovel-nosed snake	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Sidewinder	Barren/ sparsely vegetated, desert shrubland
Speckled rattlesnake	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Western banded gecko	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Western red-tailed skink	Riparian, woody riparian and wetlands
Western threadsnake (blindsnake)	Barren/ sparsely vegetated, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Zebra-tailed lizard	Barren/ sparsely vegetated, desert shrubland
Terrestrial Invertebrates	
Great Basin small blue (Small blue) butterfly	Barren/ sparsely vegetated, desert shrubland, riparian, woody riparian and wetlands
Honey Lake blue butterfly	Barren/ sparsely vegetated, saltbush shrubland
Mojave gypsum bee	Barren/ sparsely vegetated, desert shrubland
Mojave poppy bee	Barren/ sparsely vegetated, desert shrubland
Mono Basin skipper (Railroad Valley skipper) butterfly	Desert shrubland
Northern Mojave blue (Mojave blue) butterfly	Barren/ sparsely vegetated, desert shrubland
Rice's blue butterfly	Barren/ sparsely vegetated, saltbush shrubland

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative IV-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Alternative IV-B

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region IV include three federally listed and one federal candidate species, 65 BLM

sensitive species, USFS sensitive species, and state-protected species. Species-specific impacts are discussed below. Suitable habitat for the Yuma clapper rail does not occur along Alternative IV-B; therefore, impacts to this species are not expected to occur. Section 3.7.6.6 presents a description of existing disturbance along Alternative IV-B.

Desert Tortoise (Threatened)

The desert tortoise occurs along the entire length of Alternative IV-B (**Figure 3.8-6**). This species is found exclusively with the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative IV-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-54**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 553 acres and 171 acres, respectively, of potentially suitable habitat. These areas represent 0.11 percent and 0.04 percent, respectively, of potentially suitable habitat within the Region IV desert tortoise analysis area.

Several factors would combine to help minimize desert tortoise impacts as a result of the construction of Alternative IV-B. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced as appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative IV-B would be limited primarily to habitat loss and fragmentation.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative IV-B in southern Nevada in close proximity to perennial streams, wetlands, and lakes.

The types of impacts to the western yellow-billed cuckoo under Alternative IV-B generally would be the same as described for Alternative I-A (**Table 3.8-56**). Under Alternative IV-B, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoo under Alternative IV-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative IV-B in southern Nevada. Potential suitable habitat for the southwestern willow flycatcher near Alternative IV-B includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative IV-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-56**). Alternative IV-B would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative IV-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat in southern Nevada along Alternative IV-B.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation (**Table 3.8-56**). Alternative IV-B would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable wetland habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of suitable habitat within the Region IV Yuma clapper rail analysis area.

Improved access as a result of Project roads under Alternative IV-B may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-B would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative IV-B are presented in **Table 3.8-57**. The types of impacts under Alternative IV-B to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with desert shrubland are more likely to be impacted. Impacts to this habitat type are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, Western, and NDOW.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative IV-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

<u>Alternative IV-C</u>

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region IV include three federally listed and one federal candidate species, 65 BLM sensitive species and state-protected species. Species-specific impacts are discussed below. Suitable habitat for the Yuma clapper rail does not occur along Alternative IV-C; therefore, impacts to this species

are not expected to occur. Section 3.7.6.6 presents a description of existing disturbance along Alternative IV-C.

Desert Tortoise (Threatened)

The desert tortoise is found along the entire length of Alternative IV-C (**Figure 3.8-6**). This species is found exclusively with the Mojave Desert shrubland community.

The types of impacts to the desert tortoise under Alternative IV-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-54**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 645 acres and 172 acres, respectively, of potentially suitable habitat. These areas represent 0.13 percent and 0.04 percent, respectively, of potentially suitable habitat within the Region IV desert tortoise analysis area.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative IV-C. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to desert tortoises would be reduced as appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative IV-C would be limited primarily to habitat loss and fragmentation.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative IV-C in southern Nevada in close proximity to perennial streams, wetlands, and lakes.

The types of impacts to the western yellow-billed cuckoo under Alternative IV-C generally would be the same as described for Alternative I-A (**Table 3.8-56**). Under Alternative IV-C, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative IV-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative IV-C in southern Nevada. Potential suitable habitat for the southwestern willow flycatcher near Alternative IV-C includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative IV-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-56**). Alternative IV-C would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative IV-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat in southern Nevada along Alternative IV-C.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation (**Table 3.8-56**). Alternative IV-C would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable wetland habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of suitable habitat within the Region IV Yuma clapper rail analysis area.

Improved access as a result of Project roads under Alternative IV-C may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-C would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative IV-C are presented in **Table 3.8-57**. The types of impacts of construction and operation to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with desert shrubland are more likely to be impacted. Impacts to this habitat type are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, Western, and NDOW.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative IV-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact to BLM sensitive and state-protected species given the extent of native habitats in the surrounding Project region.

<u>Alternative Variations in Region IV</u>

The types of impacts to special status wildlife species under the Marketplace Alternative Variation in Region IV generally would be the same as the comparable portions of Alternatives IV-B, but would differ in the amount of habitat disturbed (**Table 3.8-58**). After considering design features and mitigation measures,

impacts to special status wildlife species from Project construction and operation would be similar to the comparable portions of Alternatives IV-B.

Table 3.8-58 Summary of Region IV Alternative Variation Impact Parameters for Special Status Wildlife Species

Impact Parameters	Marketplace Alternative Variation			Comparable Portion of Alternative IV-B		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Desert tortoise critical habitat (acres)	0	0	0	0	0	0
Desert tortoise potential habitat (acres)	109	21	5,232	80	18	7,038
USGS habitat model ranking 0.6 and higher (acres)	107	20	4,958	78	18	6,362
Length of transmission line (miles)	8			7		
Number of special status raptor nests within 1 mile of the reference line	0			0		

Alternative Connectors in Region IV

The five alternative connectors would include minimal increases of total special status wildlife habitat disturbance if they were to be utilized. These alternative connectors would cross desert tortoise potential habitat. **Table 3.8-59** summarizes impacts associated with the alternative connectors in Region IV.

Table 3.8-59 Summary of Region IV Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Sunrise Mountain Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 38 acres of construction and 8 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 26 acres of construction and 6 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.
Lake Las Vegas Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 54 acres of construction and 19 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 52 acres of construction and 18 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.

Table 3.8-59 Summary of Region IV Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Three Kids Mine Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 93 acres of construction and 34 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 81 acres of construction and 30 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.
River Mountains Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 142 acres of construction and 57 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 104 acres of construction and 41 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • One peregrine falcon nest is within 1 mile of the reference line.
Railroad Pass Alternative Connector (Alts IV-A & IV-B)	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 58 acres of construction and 14 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 56 acres of construction and 13 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.

Region IV Conclusion

A comparison of impact parameters for Region IV alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-56**. Alternative IV-C would result in the greatest direct and indirect impacts to desert tortoise potential habitat in comparison to the other Region IV alternatives (**Table 3.8-54**). Alternative IV-C also would result in the greatest direct and indirect impacts to Southwestern willow flycatcher, Western yellow-billed cuckoo, and Yuma clapper rail potential habitat in comparison to the other Region IV alternatives (**Table 3.8-56**). The greatest level of impacts to special status wildlife species among all Region IV alternatives associated with Alternative IV-C is due to greater impacts to desert tortoise habitat. However, project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term after applying BMPs, design features, and additional mitigation.

3.8.6.8 Impacts from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. The special status wildlife analysis area would exist under current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). Therefore, impacts to special status wildlife species associated with the development of the proposed Project would not occur.

3.8.6.9 Residual Impacts

Although it is anticipated that wildlife mitigation measures would be successfully implemented, some residual impacts to wildlife would occur. Wildlife injuries and mortalities are expected to occur as a result of

collisions with transmission towers and guy wires, collisions with transmission lines, and collisions with vehicles.

It is anticipated that reclamation efforts would be successful and thus no residual impacts to habitats would occur. Timeframes for successful reclamation can vary by habitat type and initial impact intensity. During extended periods of reclamation it is expected that habitat functionality may be reduced due to habitat fragmentation.

3.8.6.10 Irreversible and Irretrievable Commitment of Resources

Construction and operation of any of the proposed Project alternatives would result in the irretrievable commitment of both wildlife and wildlife habitats during the life of the project. Depending on the selection of alternatives, the amount of wildlife habitat irretrievably committed would range from 9,959 acres to 12,164 acres. However, as discussed **Appendix D**, it is anticipated that upon decommissioning of the Project reclamation measures should result in the return of impacted areas to native habitats. Some vegetation communities are expected to return to a native state within in a relatively short period of time (i.e., 5 years). Other more sensitive habitats such as sagebrush shrublands may require up to 50 years or longer to return to native conditions. Regardless of timeframes, it is possible that wildlife habitat disturbed during construction could return to pre-project conditions, thus avoiding any irreversible commitments of wildlife resources.

3.8.6.11 Relationship Between Local Short-term Uses and Long-term Productivity

Wildlife habitat would be diminished until reclaimed areas return to mature vegetation communities. As discussed above, these temporal losses can vary in the time required to return to pre-construction conditions. This range of temporal loss is expected to be between 5 and 50 years, depending upon the vegetation community. Construction and operation of any of the Project alternatives is anticipated to result in minor impacts to the short-term productivity of local migratory bird populations and sagebrush obligate wildlife species due to loss or degradation of habitat. These impacts are expected to be limited to mortality resulting from collisions with Project infrastructure and avoidance due to increased predation. Impacts from direct habitat loss are expected to be negligible because the total anticipated loss of wildlife habitat due to Project construction will be less than 1 percent of available habitats within the Project analysis area.

3.9 Aquatic Biological Resources

3.9.1 Regulatory Background

Regulations that directly influence aquatic species and habitat management decisions within the analysis area are primarily implemented by the BLM, USFS, and state wildlife agencies, which consist of the WGFD, CPW (formerly CDOW), UDWR, and NDOW. The aquatic species and habitat regulations relevant to the proposed project are presented in **Table 3.9-1**. Regulations and statutes related to special status aquatic species are provided in Section 3.10, Special Status Aquatic Species.

Table 3.9-1 Relevant Regulations for Aquatic Species

Topic	Regulation
Aquatic Species Jurisdiction	• Wyoming Statutes 23-1-103; • Colorado Revised Statutes 33-1-101; • Utah Code 23-15-2; and • Nevada Administrative Code 503-020 and Nevada Revised Statutes 501.097.
Aquatic Species Protection	• Wyoming Game and Fish Commission, Chapter 52, Section 9; • Colorado Revised Statutes 33-1-101; • Utah Code 23-14-1, 23-14-18, and 23-14-19 and Rules R657-3, R657-13, and R657-16; and • Nevada Administrative Code 503 (503.270 through 503.430) – Fishing and Miscellaneous Protective Measures.
Prevent Invasive Species Infestation	• Wyoming Game and Fish Commission, Chapter 62 • Colorado Revised Statutes 33-1-101, 33-2-104; • Utah Code 23-27-301 and 23-27-401 and Rules R657-60; and • Nevada Administrative Code 503-030, 503-050, 503-075, 503-080.

The analysis for aquatic biological resources assumed the BLM and the USFS would continue to assist in managing aquatic habitats in coordination with the USFWS and applicable state wildlife agencies (i.e., WGFD, CPW, UDWR, and NDOW). State agencies would manage aquatic species. The USFWS would have jurisdiction over the management of ESA-listed aquatic species.

3.9.2 Data Sources

Information regarding aquatic species and their habitat within the analysis area was obtained from a review of existing published sources, BLM resource management plans, USFS forest management plans, BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information as a result of correspondence with agency fishery biologists was incorporated as appropriate.

3.9.3 Analysis Area

The analysis area for aquatic biological resources consists of all alternative routes, and includes a buffer of 1-mile (2-mile width centered on each alternative route); specifically including a one-mile downstream reach of all waterways crossed by any potential route. This analysis area considers all aquatic habitats and species that may be present, based on available literature and data reviewed for the project. For

context, project-related impacts are also discussed in terms of a larger project analysis area comprised of the fifth-level Watersheds (HUC10) crossed by the alternative routes' 250-foot-wide transmission line ROW.

3.9.4 Baseline Description

3.9.4.1 Aquatic Habitats

Aquatic habitat in the analysis area includes a mixture of streams, springs, wetlands, and lakes/reservoirs that support aquatic species. Refer to Section 3.5, Vegetation for a description of wetlands. Stream habitats consist of perennial, intermittent, and ephemeral waterbodies. Perennial streams contain water continuously during a normal or average year, while intermittent (sporadic or periodic flows) and ephemeral (short-lived or transitory flow) provide temporary habitat during the year. Due to the presence of water throughout the year, perennial waterbodies provide key habitat for fish and other aquatic communities. Perennial streams represent the predominant type of aquatic habitat located within the analysis area. The highest number of perennial streams is crossed by the 2-mile transmission line corridors in Colorado and Utah. Lakes/reservoirs and springs also are located in the analysis area, although there are considerably fewer when compared to perennial streams.

Aquatic habitats are managed by the agency that owns or has jurisdiction for the land (e.g., BLM, USFS, and USFWS refuges). On lands with federally listed species, their habitat and species management is under the jurisdiction of the USFWS. Aquatic habitat quality is included in waterbody classifications that are used by the state agencies. The analysis area in Wyoming, Colorado, and Utah contains high quality trout habitat.

3.9.4.2 Fish

Within the analysis area, fish species are managed by the state agencies (WGFD, CPW, UDWR, and NDOW), with coordination and cooperation with federal agencies (BLM, USFS, and USFWS). Collectively, the state and federal agencies develop and implement management plans and strategies for both game and nongame fish species and determine management practices that involve fishing regulations and habitat protection. Management direction and guidance are provided through the implementation of management plans, agreements, and their wildlife plans (e.g., Colorado's Comprehensive Wildlife Conservation Strategy and Wildlife Action Plans [CDOW 2006], Wildlife Action Plan [2006], Utah Comprehensive Wildlife Conservation Strategy [Sutter et al. 2005], and Wyoming State Wildlife Action Plan [2012]).

As a result of their recreational value, game fish species are an important focus in the management of aquatic species within the analysis area. Recreational game fish species within the analysis area consist of coldwater (trout), cool water (pike, walleye, and smallmouth bass), and warm water species (sunfish, largemouth bass, yellow perch, and catfish). The three fishery categories are based on temperature tolerances, with warm water species having the highest temperature tolerance. In total, 26 game fish species, subspecies or hybrids occur within the analysis area (**Table 3.9-2**). The majority of the game fish species are represented by trout, which are distributed throughout the analysis area. Two of the trout species, Bonneville cutthroat trout and Colorado River cutthroat trout, are special status species, which are discussed in Section 3.10, Special Status Aquatic Species. Five additional families (catfish, sunfish, temperate bass, pike, and perch) with game fish species are present within the analysis area. General spawning periods and habitat for the more common game fish species within the analysis area are provided in **Table 3.9-3**. The spawning periods are approximate and could occur in only a portion of a particular month, and also could vary based on different temperature regimes within the northern and southern portions of the analysis area. Game fish species are summarized by Project region in Section 3.9.5, Regional Summary.

Table 3.9-2 Game Fish Species and General Habitat

Common Name	Scientific Name	General Habitat
Trout and Salmon	Salmonidae	
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	Streams
Brook trout	*Salvelinus fontinalis*	Streams, lakes/reservoirs
Brown trout	*Salmo trutta*	Streams, lakes/reservoirs
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	Streams
Cutthroat trout	*Oncorhynchus clarkii*	Streams
Grayling	*Thymallus thymallus*	Lakes and streams
Mountain whitefish	*Prosopium williamsoni*	Streams
Rainbow trout	*Oncorhynchus mykiss*	Streams, lakes/reservoirs
Snake River cutthroat trout	*Oncorhynchus clarkii bouvieri (form of Yellowstone cutthroat trout)*	Streams
Sockeye (kokanee)[1] salmon	*Oncorhynchus nerka*	Lakes/reservoirs
Tiger trout (brown x brook hybrid)	*Salmo trutta* x *Salvelinus fontinalis*	Streams, lakes/reservoirs
Catfish	Ictaluridae	
Black bullhead	*Ameiurus melas*	Streams, lakes/reservoirs
Channel catfish	*Ictalurus punctatus*	Streams, lakes/reservoirs
Sunfish	Centrarchidae	
Black crappie	*Pomoxis nigromaculatus*	Streams
Bluegill	*Lepomis macrochirus*	Lakes/reservoirs
Green sunfish	*Lepomis cyanellus*	Lakes/reservoirs
Largemouth bass	*Micropterus salmoides*	Streams, lakes/reservoirs
Rock bass	*Ambloplites rupestris*	Lakes/reservoirs
Smallmouth bass	*Micropterus dolomieu*	Streams, lakes/reservoirs
Temperate Bass	Percichthyidae	
White bass	*Morone chrysops*	Lakes/reservoirs
Wiper (striped x white bass hybrid)	*Morone saxatilis* x *Morone chrysops*	Lakes/reservoirs
Pike	Esocidae	
Northern pike	*Esox lucius*	Streams
Perch	Percidae	
Walleye	*Sander vitreus*	Streams, lakes/reservoirs
Yellow perch	*Perca flavescens*	Streams, lakes/reservoirs

[1] Kokanee is the name given to sockeye salmon that live in lake habitats.

Source: Unpublished occurrence data from WGFD (2011), CPW (2012-2011), UDWR (2013-2011), and NDOW (2011).

Table 3.9-3 Game Fish Spawning Periods and Habitat

Species or Group	Months												Spawning Habitat
	J	F	M	A	M	J	J	A	S	O	N	D	
Brook trout													Stream spawners that use gravel substrates and spring upwelling areas.
Brown trout													Stream spawners that use tributary streams with gravel substrates in riffle-run areas.
Cutthroat trout													Stream spawners that use tributary streams with gravel substrates in riffle areas.
Grayling													Stream spawners that use riffle areas with sand and gravel substrates.
Lake trout													Lake spawners that use areas with boulder, cobble, and gravel substrates.
Rainbow trout													Stream spawners that use gravel substrates at head of riffle or downstream portion of pool.
Walleye													Spawn in lakes and streams in shallow water over rock substrates.
Black bullhead													Usually spawn in weedy or muddy shallow areas by building nests.
Channel catfish													Prefers areas with structure such as rock ledges, undercut banks, logs, or other structure where it builds nests.
Largemouth bass													Shallow areas over clean gravel and sand bottoms.
Smallmouth bass													Builds nests in shallow areas over boulder, cobble, or gravel substrates.
Sunfishes													Nest builders in diverse substrates and shallow depths.
Temperate bass													Egg masses deposited over sand bars, submerged vegetation, or other instream debris.

Sources: Baxter and Simon 1970; Beauchamp 1990; Eddy and Underhill 1974; Hickman and Raleigh 1982; Raleigh et al. 1984; Raleigh et al. 1986; Raleigh 1982; and Sigler and Sigler 1996.

Waterbodies within the analysis area also support nongame fish species represented by suckers, minnows, and sculpins. Most of the sucker species occur in stream or river habitats and include species such as flannelmouth, bluehead, longnose, mountain, white, desert, and Meadow Valley Wash desert sucker. Minnow species known to occur in analysis area waterbodies include bigmouth shiner, brassy minnow, carp, creek chub, emerald shiner, fathead minnow, least chub, longnose dace, Meadow Valley

Wash speckled dace, redside shiner, roundtail chub, southern leatherside chub, speckled dace, Utah chub, and Virgin spinedace. Darter species include Iowa and Johnny. As a group, minnow species occupy all types of habitats within the analysis area. Numerous sucker and minnow species are considered special status species, which are discussed in Section 3.10, Special Status Aquatic Species.

Aquatic invasive species and whirling disease are issues within streams and lakes/reservoirs in all four states. Numerous streams have tested positive for whirling disease in Wyoming, Colorado, and Utah, some of which are located within the analysis area. Aquatic invasive species of concern in the four states include zebra and quagga mussels, New Zealand mudsnail, and rusty crayfish. Management plans (e.g., UDWR 2009; WGFD 2010) or regulations (see **Table 3.9-1**) are being used by federal and state agencies to prevent the spread of these aquatic invasive species.

USFS Management Indicator Species

Management Indicator Species (MIS) are selected because their status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of a MIS are that its status and trend provide insights to the integrity of the larger ecological system to which it belongs. Aquatic species that have been selected as MIS for the NFS lands crossed by the project are presented in **Table 3.9-4**. Two MIS (Bonneville cutthroat trout and Colorado River cutthroat trout) are also categorized as Forest Sensitive (FS) species and are presented in Section 3.10, Special Status Aquatic Species. Specific MIS occurrence in waterbodies crossed by the 250-foot-wide transmission line ROW is discussed in the Region II and III impact sections.

Table 3.9-4 USFS Management Indicator Aquatic Species for National Forests Crossed by the Project[1]

Species	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-LaSal National Forest Region II	Uintah National Forest Region II
Fish					
Bonneville cutthroat trout				FS[1] and MIS	FS[1] and MIS
Brown trout			MIS		
Colorado River cutthroat trout				FS[1] and MIS	FS[1] and MIS
Cutthroat trout			MIS	MIS	
Rainbow trout			MIS	MIS	
Southern leatherside chub			FS[1]		FS[1]
Virgin spinedace		MIS	FS[1]		
Aquatic macroinvertebrates	MIS		MIS	MIS	

[1]FS – Species also is classified as Forest Sensitive status and is addressed in Section 3.10, Special Status Aquatic Species.

3.9.4.3 Invertebrates

The characterization of invertebrate communities for this EIS is based on general information rather than specific survey results for waterbodies in the analysis area. The basis for this approach is that species composition and abundance information is not required for the impact analysis of invertebrate

communities. The exception would be the potential occurrence of special status invertebrate species, which are discussed in Section 3.10, Special Status Aquatic Species.

Invertebrate communities that occur in waterbodies located within the 2-mile transmission line corridors include a mixture of worms, immature and adult insect groups, crustaceans, snails, and numerous other groups. The composition and abundance of the invertebrate community can vary depending on the type of habitat (perennial stream, intermittent or ephemeral stream, wetland, pond, lake, or spring) and the physical characteristics of the waterbody such as flow, substrate, presence of submerged vegetation, depth, extent of riparian vegetation, elevation, gradient, and other factors. Invertebrate communities are present throughout the year in all perennial waterbodies within the analysis area. In contrast, invertebrate occurrence in intermittent or ephemeral waterbodies would be limited to the period when water is present.

Invertebrates serve important roles in the aquatic environment through their food web dynamics. They represent food sources for fish and also are used as indicators of water quality conditions (Barbour et al. 1999; Wallace and Webster 1996).

As a group, macroinvertebrates are considered USFS MIS in the Ashley and Manti-LaSal National Forests. The definition for MIS is provided in Section 3.9.4.2, Fish. This group of MIS is discussed in the Region II impact section.

3.9.4.4 Amphibians

Waterbodies located within the analysis area also provide habitat for amphibians (salamanders, toads, and frogs) and aquatic reptiles (turtles). Many of the toad species such as plains spadefoot toad, Great Basin spadefoot toad, and salamanders occur in terrestrial habitats throughout most of the year, but move to aquatic habitats for breeding in the spring or early summer. The types of habitats used for breeding include perennial streams, reservoirs, ponds, wetlands, or seasonal flooded areas. Salamander and toad species overwinter in burrows and other moist areas in terrestrial habitat. Most frog species are associated with permanent wet areas including streams, ponds, and wetlands (Cerovski et al. 2004; Hammerson 1999). Breeding typically occurs in the spring or early summer for frogs and aquatic reptiles. Most frog species overwinter in the bottom substrate of their occupied aquatic habitats. The potential occurrence for special status amphibian species such as Arizona toad, boreal toad, Columbia spotted frog, and northern leopard frog are discussed in Section 3.10, Special Status Aquatic Species.

3.9.5 Regional Summary of Aquatic Biological Resources

A summary of game fish occurrence by project region is provided in **Table 3.9-5**. The highest number of game fish species occurs in Regions I and II. Invertebrate and amphibian species are present in all four regions. A list of basins and watersheds that are located within the four regions is provided in **Table 3.4-2** in Water Resources. A summary of special status aquatic species is discussed in Section 3.10.5.

Table 3.9-5 Game Fish Species Occurrence by Project Analysis Area and Region

Fish Species	Region			
	I	II	III	IV
Trout and Salmon				
Bonneville cutthroat trout		X		
Brook trout	X	X		
Brown trout	X	X		
Colorado River cutthroat trout	X	X		
Cutthroat trout		X		

Table 3.9-5 Game Fish Species Occurrence by Project Analysis Area and Region

Fish Species	Region			
	I	II	III	IV
Mountain whitefish		X		
Rainbow trout	X	X	X	
Snake River cutthroat trout	X			
Sockeye (Kokanee) salmon	X	X		
Tiger trout (brown x brook hybrid)		X		
Catfishes				
Black bullhead	X	X		
Channel catfish	X	X		
Sunfishes				
Black crappie	X	X		
Bluegill	X	X		
Green sunfish	X	X	X	
Largemouth bass		X		X
Rock bass	X	X		
Smallmouth bass	X	X	X	X
Temperate Basses				
White bass	X	X	X	
Wiper (striped x white bass hybrid)			X	
Pike				
Northern pike	X	X		
Perches				
Walleye	X	X		
Yellow perch		X		

Sources: Unpublished occurrence data from WGFD (2011), CPW (2012-2011), UDWR (2013-2011), and NDOW (2011).

3.9.6 Impacts to Aquatic Biological Resources

Potential impacts to aquatic biological resources were identified based on feedback from federal and state agency biologists, public scoping, and literature related to surface disturbance effects on aquatic habitat and species. Potential effects from surface disturbance activities would include direct alteration of habitat or loss of individuals from equipment and vehicles. Habitat also could be affected by changes in water quality from increased sedimentation and potential fuel spills. The use of surface water for dust control and concrete foundations also was evaluated in terms of effects on aquatic habitat.

The methodology for evaluating impacts on aquatic biological resources involved comparisons of project activities within the analysis area to habitat that supports aquatic species with an emphasis on game and native fish species. The impact analysis area for aquatic biological resources included perennial streams and springs that are crossed by the alternative 250-foot-wide transmission line ROWs and contain game and native fish species. A downstream reach of approximately 1 mile also was considered part of the analysis area. The analysis area for roads focused on perennial streams, lakes, reservoirs, and springs

with game and native fish that are crossed by each alternative's 2-mile transmission line corridor. The larger analysis area for access roads was required because their locations have not been defined at this time. GIS analyses were conducted to identify perennial waterbodies and game fish occurrence within the proposed disturbance areas (i.e., 250-foot-wide transmission line ROWs and 2-mile transmission line corridors, terminals, electrode bed siting areas).

Impact issues and the analysis considerations for aquatic biological resources are listed in **Table 3.9-6**. Identification of aquatic habitat potentially affected by project activities focused on waterbodies that support aquatic species on a persistent basis throughout the year (perennial streams and springs). Lakes and reservoirs were included in the analysis to address potential sedimentation effects. However, construction traffic and equipment would not cross lake and reservoir habitats.

Table 3.9-6 Relevant Analysis Considerations for Aquatic Biological Resources

Impact Issues	Analysis Considerations and Relevant Assumptions
Potential direct and indirect effects of construction activities and roads on habitat and aquatic species	The analysis includes direct and indirect disturbance effects and potential water quality changes from sediment delivery and fuel spills.
Potential for introduction of invasive or nuisance aquatic species from construction equipment	The analysis considers the potential introduction or transfer of nuisance aquatic species resulting from vehicles crossing multiple drainages, based on nuisance species occurrence information.
Potential for increased fishing pressure on streams from construction work crews and the public from the construction area and access roads	The analysis evaluates the potential for increased fishing pressure on game fisheries, based on the presence of workers near streams.
Potential direct and indirect effects of construction water use on aquatic habitat and species	The analysis uses the results of the water resources impact analysis, which determines if water sources are linked to surface flows of streams crossed by the alternative 250-foot-wide transmission line ROWs. Flow reductions could detrimentally affect habitat for aquatic species.
Potential mortalities to amphibians from vehicle traffic during seasonal movement periods	The analysis evaluates the potential impacts of vehicle traffic within the ROW and access roads on amphibians.

Impact parameters were used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among alternatives or alternative variations. The following impact parameters were used in this analysis:

- Number of perennial streams with game or native fish species crossed by the 250-foot-wide transmission line ROW associated with each of the alternatives.
- Number of perennial streams with game or native fish species crossed by 2-mile transmission line corridor widths (access road analysis).
- Potential loss of aquatic habitat (feet^2) due to culverts or low water construction.
- Acres of riparian area disturbance from roads.

3.9.6.1 Impacts from Terminal Construction and Operation

The Northern and Southern terminals would be constructed regardless of alternative route or design option.

Northern Terminal

Construction of the Northern Terminal would not result in direct disturbance effects on aquatic habitat and species, since no perennial waterbodies are located within the proposed disturbance area. In addition, road access would not affect special status aquatic species because existing or new roads would not cross waterbodies inhabited by these species.

Water use for substation/converter station construction would require approximately 1.8 acre-feet for dust control and concrete. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. The effect determination of new and existing water depletions in Wyoming would be made by the Wyoming State Engineer after the water sources are identified and an evaluation of their potential connection to surface flows is completed. Water use for the terminals would not affect surface flows or reduce habitat for aquatic species.

Southern Terminal

Construction of the Southern Terminal would disturb previously developed upland areas in the Eldorado Valley watershed near Boulder, Nevada. Waterbodies located adjacent to the area include playa lakes. No perennial waterbodies are located in this area. No special status species habitat is located within the playa lakes. Surface disturbance and use of access roads would not affect aquatic species, since habitat is not located within the proposed disturbance area for the Southern Terminal.

Water required for dust control and concrete during construction of the Southern Terminal is estimated to be 1.2 acre-feet. The source of the water would be existing rights. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed. The evaluation would determine if water use could affect surface water quantity or habitat used by aquatic species.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Impacts to aquatic biological resources would be the same as discussed in Section 3.9.6.1, Impacts from Terminal Construction and Operation, and Section 3.9.6.2, Impacts Common to All Alternative Routes and Associated Components. No additional impacts would occur at the southern terminal or ground electrode site near IPP.

Design Option 3 – Phased Build Out

Impacts to aquatic biological resources would be the same as discussed in Section 3.9.6.1, Impacts from Terminal Construction and Operation, and Section 3.9.6.2, Impacts Common to All Alternative Routes and Associated Components. The only difference resulting from this option is that impacts would occur at later time frames due to the phased build out schedule.

3.9.6.2 Impacts Common to All Alternative Routes and Associated Components

Potential direct and indirect effects of Project construction, operation, and decommissioning on aquatic habitat and species are discussed below for each of the resource issues listed in **Table 3.9-6**. After impacts are identified, relevant agency BMPs and design features are discussed in terms of reducing impacts. If impacts of concern remain after application of BMPs and design features, additional mitigation is recommended to further reduce impact levels.

Construction Impacts

Direct Disturbance Effects on Habitat and Species

Equipment and vehicle traffic within the ROW and access roads could cross small and moderate-size streams (generally less than 100 feet in wetted width) or springs. The number of game fish streams crossed by the 250-foot-wide transmission line ROWs and 2-mile transmission line corridors are provided in the region sections.

Two types of crossings would be used for flowing streams: fords and culverts. The estimated disturbance per crossing for these two methods include 1,250 feet^2 (25-foot width X 50-foot length) for the ford technique, and 7,500 feet^2 (50-foot width X 150-foot length) for culverts. Flow would be maintained during construction involving stream crossings. If needed, culverts would be installed under the direction of a qualified engineer in coordination with hydrologists and aquatic biologists from the BLM, USFS, and state agencies. Compliance with necessary permits also would be required. For streams that contain fish, culverts would be designed to maintain or improve passage by aquatic species. Vehicle crossings would result in mortalities to macroinvertebrates and possibly early life stages of fish. Juvenile and adult fish would likely move from the disturbed area. Stream crossings also would alter bottom substrates. Habitat alteration could affect various activities or values for fish such as cover, feeding, or life stage functions for spawning or early life stage development. The disturbed area including bottom substrates would be restored to pre-construction conditions after construction is completed.

Construction at stream crossings also would remove riparian vegetation. Vegetative cover along streambanks provides cover for fish, shading, bank stability, and increased food and nutrient supply as a result of deposition of insect and vegetative matter into the watercourse. Riparian vegetation also contributes woody material to streams that are used for fish cover and can be part of forming habitat features such as pools. Disturbance to the streambank areas at stream crossings would represent a relatively small width (portion of 250-foot-wide transmission line ROW on each streambank). Given the relatively small width of the disturbance area associated with an individual stream crossing, impacts would be considered low in relation to the entire stream system. Potential ground disturbance effects to riparian habitat are provided in the region sections.

BMPs that would reduce impacts to aquatic habitat include the following: ECO-2 (develop a habitat restoration plan), ECO-3 (minimize stream crossings by roads), and WAT-11 (avoid alteration of existing drainages). Design features would be applied that would comply with federal, state, and local regulations, minimize disturbance to drainage channels, vegetation, and stream banks, and restore the disturbed area to equal or better conditions (TWE-8). This design feature also would restrict structures from being sited within 200 feet from streams. Design feature TWE-12 would avoid structures being placed near riparian areas. Examples of state regulations include the Stream Alteration Permit that would be required by the Utah Division of Water Rights in Regions II and III for each stream crossing. This permit would require that construction activities have minimal impacts both individually and cumulatively on the aquatic environment. In conclusion, when considering the relatively small disturbance area at stream crossings and the use of BMPs and design features, stream crossing construction would alter and permanently remove a relatively small amount of stream habitat. Construction could alter flow conditions and game fish spawning habitat depending on the timing of construction. Two additional mitigation measures are recommended for culvert construction if proposed for road crossing of streams.

AB-1 *(Fish Passage): When avoidance of perennial streams with fish populations is not feasible and a culvert is required during construction, flow would be maintained in a portion of the stream to allow unrestricted fish passage. Any plan for dewatering the stream at the culvert site must be approved by the appropriate federal and state agencies. Culvert size and type would be selected to facilitate the continued and long-term connectivity and movement of target aquatic species. If the culvert is proposed to be in place during project operation, approval must be obtained from the federal or state agency management authority. An alternative crossing method may be required.*

Effectiveness: This measure would be highly effective in maintaining fish movement through the construction area.

AB-2 *(Avoid Game Fish Spawning Periods): If spawning areas for game fish species are known to occur at streams proposed for vehicle crossing or culvert construction, instream disturbance would be scheduled to avoid the spawning period. The exact dates for avoidance would be determined through discussions with WGFD, CPW, or UDWR. All disturbed areas would be restored to pre-construction conditions prior to the next spawning season.*

Effectiveness: This measure would be highly effective in avoiding impacts on game fish spawning.

Through the implementation of BMPs, design measures, and additional mitigation measures, stream crossing construction would not permanently remove habitat and detrimentally affect fish population numbers. There could be temporary reductions in macroinvertebrate numbers at stream crossings; however, their composition and numbers would recover during subsequent colonization of the construction area by invertebrates. The installation of culverts would result in a permanent loss of aquatic habitat.

Water Quality Effects on Habitat and Species

Vehicle and equipment disturbance within or near waterbodies also would cause sedimentation. Road density estimates are provided as an indication of sediment effects by watershed in the region sections. Sediment entering the water column would be redeposited in areas downstream of the disturbed area. The extent of the sedimentation effect would depend on the flow conditions, substrate composition, stream configuration, and types of aquatic communities located within the affected areas. The indirect effects of sedimentation could range from potential detrimental effects on species behavior, physiological functions, or spawning (Waters 1995). In general, salmonid (trout) species are more sensitive to increased turbidity compared to many of the warmwater fish species. Sediment deposition in substrates used for spawning could detrimentally affect successful egg development. The impact level would be determined by fish species presence, the timing of the construction in relation to spawning periods, and the closest spawning areas to the disturbance area. The duration of sediment impacts could last for several months to approximately one year depending on the timing of construction in relation to spring flows and other precipitation events that would flush sediments. The recovery period for biological communities could range from several months for macroinvertebrates to one year for fish (Waters 1995). The recovery period could be less if sediment levels were at relatively low concentrations. BMPs that would reduce sedimentation impacts to aquatic habitat include WAT-9 (implement erosion control measures). Design feature TWE-13 would be applied to control erosion input to streams.

Vehicle and equipment use within or near waterbodies also would pose a risk to aquatic biota from fuel or lubricant spills. If fuel reached a waterbody, aquatic species could be exposed to toxic conditions. Spills also would result in chemical residues within or on substrate in waterbodies. Impacts could include direct mortalities or reduced health of aquatic organisms. The magnitude of impacts would depend on the volume of spilled fuel, flow conditions, channel configuration, and presence of aquatic species. Impacts from fuel spills would be avoided or minimized by design feature TWE-24 that restricts refueling within 100 feet of wetlands and streams. TWE-24 also would implement spill prevention and containment measures in the event that a spill occurred during construction. In conclusion, the use of design features would reduce potential detrimental water quality changes involving increased sediment and fuel spills to a level that would not affect aquatic habitat or fish population viability on a long-term basis.

Through the implementation of BMPs and design features related to erosion control and fuel spills, impacts to water quality and aquatic habitat and species would be minor or low magnitude. Impacts on aquatic habitat and species would be temporary and at a level that would not detrimentally affect fish and other aquatic species populations.

Invasive Species

Stream crossings by vehicles and equipment pose a risk of transferring invasive aquatic species between drainages during construction. Aquatic invasive species of concern in the four states include whirling disease, zebra and quagga mussels, New Zealand mudsnail, and rusty crayfish. Various life stages of these invasive species could attach to vehicles or equipment and be introduced to a waterbody during the waterbody crossings associated with construction and maintenance activities. Management plans (e.g., UDWR 2009; WGFD 2010) or regulations (see **Table 3.9-1**) are being used by federal and state agencies to prevent the spread of these aquatic invasive species. No BMPs or design features have been defined to require equipment or vehicle washings prior to crossing waterbodies. As a result of the potential risk of introducing or spreading invasive aquatic species, the following mitigation measure is recommended.

AB-3 *(Invasive Aquatic Species Protection): It is assumed that any waterbody could contain aquatic invasive species and invasive weed species. If work occurs in or near a waterbody, all equipment would be decontaminated. Decontamination would occur before arrival at a project site to avoid the transfer of aquatic invasive species from a previous work site in or near water. Decontamination would consist of either of these actions: 1) Drain all water from equipment and compartments; clean equipment of all mud, plants, debris, and aquatic organisms; and dry equipment for specified time by season (5 days in June through August, 18 days in March through May, and 3 days in December through February when temperatures are at or below freezing); or 2) Use a high pressure (2,500 psi) hot water (140°F) pressure washer to thoroughly clean equipment and flush all compartments that may hold water. A field monitor would be present to ensure that the cleaning was completed prior to vehicle and equipment moving to other streams and drainages.*

Effectiveness: This measure would be highly effective in avoiding the transfer of invasive aquatic species due to the cleaning technique.

By implementing mitigation measure **AB-3**, the introduction or transfer of invasive aquatic species would not occur.

Water Use Effects on Habitat and Species

The estimated water use required per mile of transmission line construction is approximately 3,400 gallons for foundation concrete and 240,000 gallons for dust control. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners or irrigation companies holding existing water rights. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed.

Existing water rights would be used for concrete production and dust control during construction of project transmission line and associated facilities. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by aquatic species.

Additional Fishing Pressure on Game Fish Streams / Fish Regulations

Fishing pressure on streams with game fish species could increase as a result of construction crews. The increased fishing pressure could result in higher numbers of fish harvested in some of the streams near the Project. However, the work crews would have limited time off; therefore, the anticipated impact level is considered to be low. Two design features also would contribute to low level impacts from potential fishing pressure. TWE-2 states that the applicant and its contractors would comply with applicable environmental laws and regulations including fishing regulations on harvest limits and purchase of state fishing licenses. TWE-4 requires that all personnel would be instructed on the protection of ecological resources including

fish species. In conclusion, impacts from potential increased fishing pressure would not violate fishing regulations and affect game fish populations.

By following design features for the Project, impacts from potential increased fishing pressure would not violate fishing regulations and affect game fish populations.

Vehicle Effects on Amphibians

Construction traffic within the ROW could result in amphibian mortalities during spring and summer breeding migrations to and from flooded areas, wetlands, streams, ponds, or lakes. Vehicle crossings of streams could cause frog mortalities, since they use these habitats throughout the year. Vehicle traffic also could result in toad mortalities in upland terrestrial habitat. This potential reduction in amphibian numbers is expected to be relatively low due to low traffic levels. Vehicle activity also could cause increased sediment on a temporary basis in stream disturbance areas. BLM stipulations would provide protection to aquatic habitat and buffer distances around perennial streams and wetlands. The buffer distance varies from 100 to 500 feet depending on the BLM field office. Some field offices require complete avoidance of the 100-year floodplain. To provide consistency in the protection of wetland habitat, additional mitigation is proposed in Section 3.5, Vegetation. Mitigation measures WET-2 and WET-4 would require no disturbance within 500 feet of wetlands.

Operation Impacts

The direct and indirect effects of operation of the Project would involve use of access roads and the ROW for repair and maintenance activities and vegetation management. Impacts associated with operation activities would involve several of the same types of effects discussed for construction activities.

Direct Disturbance to Habitat and Species

Direct disturbance to stream habitat would occur due to vehicle traffic during the annual transmission line inspection and vegetation clearing. In most situations, vehicles would use existing access roads. However, movement along the ROW may require crossings of small streams where access roads do not exist. It is assumed that fewer stream crossings may be required because the access road system would have been constructed. Project design would limit stream crossings if feasible. Some of the roads that cross streams would have culverts to protect the waterbody from future vehicle disturbance. The types of direct impacts would be the same as discussed for construction. Some riparian vegetation may be trimmed to maintain the buffer zones from wires. However, the applicant would retain as much riparian vegetation as possible at stream crossings. BLM stipulations would protect riparian areas on public lands by restricting surface distance in these areas. The buffer distance varies from 100 to 500 feet. However, riparian stipulations do not exist for the entire project area. The reduction of riparian vegetation at stream crossings would result in the same types of impacts on aquatic habitat, as discussed for construction.

The BMPs, design features, and additional mitigation measures (**AB-1** and **AB-2**) also would be applied to vehicle movements and vegetation maintenance during operation. Operation activities would not permanently remove habitat and affect fish population numbers. Temporary reductions in macroinvertebrate numbers could occur at stream crossings, but this community would recover as they recolonize aquatic areas.

Water Quality Effects on Habitat and Species

Vehicle traffic within the ROW and access roads near streams could result in increased sediment and fuel spill risks. The effects of these water quality changes on aquatic habitat and species would be the same as discussed for construction. The same BMPs and design features would be applied to minimize these types of impacts on aquatic biological resources. Herbicides may be used to control vegetation as part of maintenance activities in the ROW. VEG-3 requires that herbicide use should be limited to non-persistent, immobile formulations to avoid effects on aquatic habitats. Design features involving erosion control and

spill response and containment also would be implemented. In addition to the BMPs, the following mitigation measure is recommended to avoid potential herbicide effects on biological resources.

AB-4 *(Herbicide Use Plan): As part of vegetation management, the applicant would prepare an Herbicide Use Plan. The Plan would identify a list of approved herbicides that may be used as well as locations of areas that may be treated. Licensed herbicide applicators would be used in the treatment process. All herbicides would be used in accordance with label instructions for the chemical. The Plan also would discuss compliance with applicable federal, state, and local agencies.*

Effectiveness: This measure would be highly effective in avoiding toxic effects of herbicide use on special status aquatic species.

By implementing BMPs and design features related to erosion control and fuel spills, impacts to water quality and aquatic habitat and species would be minor or low magnitude. Mitigation measure **AB-4** would avoid effects of herbicides on water quality and aquatic species and their habitat. Impacts on aquatic habitat and species would be temporary and at a level that would not detrimentally affect fish and other aquatic species populations.

Invasive Species

Stream crossings by vehicles and equipment pose a risk of transferring invasive aquatic species between drainages during operation and maintenance activities. Impacts would be similar to construction activities except that fewer stream crossings may be required, since the road access system would be established during construction. Mitigation measure **AB-3** also would be applied to operation and maintenance activities. By implementing mitigation measure **AB-3**, the introduction or transfer of invasive aquatic species would not occur.

Decommissioning Impacts

Removal of project structures during decommissioning would result in the same types of impacts discussed for construction activities. Direct disturbance to aquatic habitat would occur as a result of vehicle traffic across streams. The Applicant would be responsible for reclamation of access roads following abandonment in accordance with landowner's or land agency's direction. Water quality changes involving increased sediment and fuel spill risks would occur as a result of vehicle traffic within or near waterbodies. The potential spread of invasive aquatic species also could result from vehicle crossings and movement between drainages. The same BMPs and design features would be applied to reduce impacts during decommissioning activities. Removal of riparian vegetation would not be required as part of decommissioning.

3.9.6.3 Region I

Table 3.9-7 provides a comparison of impacts associated with the alternative routes in Region I. BMPs, design features, and mitigation measures would be implemented to reduce impacts to aquatic biological resources in the potentially affected waterbodies. Game fish occurrences for Region I's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-4** for streams and **Table G-5** for waterbodies (i.e., reservoirs, lakes, and springs).

A road density analysis was used as an indicator of potential sediment effects on perennial streams. The methodology for this analysis is provided in Section 3.4, Water Resources. The results of the road density analysis for Region I alternatives is provided in **Table 3.4-7**.

Table 3.9-7 Summary of Region I Alternative Route Impact Parameters for Aquatic Biological Resources

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	2	2	18	2
Number of Game Fish Streams Crossed by 250-foot-wide ROW	2	2	8	2
Number of Game Fish Stream 250-foot-wide ROW Crossings	2	2	16	2
Potential Aquatic Habitat Alteration or Loss[2] (feet^2)	0	0	3,600	0
Potential Aquatic Habitat Alteration or Loss (acres)	0	0	0.08	0
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	0	0	<0.1	0
Number of Reservoirs/Lakes Located within the 2-mile Wide Transmission Line Corridor	7	4	3	5
Number of Springs Located within the 2-mile Wide Transmission Line Corridor	0	1	1	2

[1] Additional unnamed perennial streams may be crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Little Snake and Yampa.

Potential ground disturbance effects associated with the construction and operation of Region I alternative ROWs on riparian habitat at 100 and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-8**. The highest level of potential disturbance is indicated for Alternative I-C. By following stipulations for BLM FOs involving no disturbance or a buffer protection of 300 to 500 feet depending on the BLM FO (see **Appendix C**), impacts on riparian vegetation would be avoided.

Table 3.9-8 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region I

	Alternatives							
	I-A		I-B		I-C		I-D	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams								
Construction	4	7	3	6	22	59	3	6
Operation	1	2	1	2	6	16	1	2
Reservoirs/Lakes/Springs								
Construction	1	2	<1	1	4	14	2	4
Operation	<1	1	<1	<1	1	3	<1	1

Alternative I-A (Applicant Proposed)

Key Parameters Summary

Alternative I-A would cross two named perennial streams (Little Snake and Yampa rivers), which contain two warmwater game fisheries. There would be no habitat loss or alteration since vehicle crossings or culverts would not occur for larger rivers. Seven reservoirs/lakes are located within Alternative I-A's 2-mile transmission line corridor. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at the perennial streams located within the construction ROW. Water use for

concrete foundations and construction dust control would be 116 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species.

Alternative I-B

Key Parameters Summary

Alternative I-B would cross the same two named perennial streams (Little Snake and Yampa rivers), as discussed for Alternative I-A. There would be no habitat loss because culverts or direct disturbance would not occur in the Little Snake and Yampa rivers. Four reservoirs/lakes and one spring are located within the Alternative I-B 2-mile transmission line corridor. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at the perennial streams located within the construction ROW. Water use for concrete foundations and construction dust control would be 119 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-B. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species.

Alternative I-C

Key Parameters Summary

Alternative I-C would cross 18 named perennial streams. Eight of the perennial streams contain game fisheries: Muddy Creek (3 crossings), Elkhead Creek (2 crossings), Fortification Creek, Fourmile Creek, Little Bear Creek, Little Cottonwood Creek, Little Snake River, and Yampa River (6 crossings). Three reservoirs/lakes and one spring are located within the Alternative I-C 2-mile transmission line corridor. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment could be 3,600 feet^2 (0.08 acre). Large river crossings such as the Green, Little Snake, and Yampa were excluded from the habitat loss estimate because vehicle crossings or culverts would not occur as part of construction. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning. BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat at all perennial stream crossings. There could be temporary reductions in macroinvertebrates at stream crossings. Water use for concrete foundations and construction dust control would be 139 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert. Construction traffic could result in reductions in amphibian numbers if the schedule coincides with amphibian movements.

Alternative I-D (Agency Preferred)

Key Parameters Summary

Alternative I-D would cross two named perennial streams (Little Snake and Yampa rivers), both of which contain game fish species. In addition, five reservoirs/lakes and two springs are located within the Alternative I-D 2-mile transmission line corridor. There would be no habitat loss because culverts or direct disturbance would not occur in the Little Snake and Yampa rivers. The same BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at perennial streams located within the construction ROW. Water use for concrete foundations and construction dust control would be 128 acre-feet. The effect determination of new and existing water depletions would be made after the

water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-D. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species.

If the Tuttle Easement micro-siting options were implemented, no additional perennial waterbodies would be crossed or impacted by this portion of Alternative I-D.

Alternative Connectors in Region I

The Fivemile Point North, Mexican Flats, and Baggs alternative connectors would include minimal increases of total crossed waterbodies, disturbed areas, and water use if they were to be utilized. The Mexican Flats and Fivemile Point North alternative connectors would cross one impaired waterbody; Muddy Creek would be crossed on the same reach as Alternative I-C. The Baggs Alternative Connector would cross one large floodplain. **Table 3.9-9** summarizes impacts and advantages associated with the alternative connectors in Region I.

Table 3.9-9 Summary of Region I Alternative Connector Impacts for Aquatic Biological Resources

Alternative Connector	Analysis	Impact Conclusion
Fivemile Point North, Fivemile Point South, and Mexican Flats Alternative Connectors	One additional perennial stream (Muddy Creek) is located within the 2-mile transmission line corridor for the Fivemile Point North and Mexican Flats connectors, and could be impacted by vehicle traffic on access roads. No streams are crossed by the Fivemile Point South Alternative Connector.	The disadvantage of using these alternative connectors would be potential increased disturbance to Muddy Creek and aquatic species (invertebrates and possibly nongame fish).
Baggs Alternative Connector	Two additional perennial streams (Little Snake River and Muddy Creek) are located within the 2-mile transmission line corridor. Muddy Creek is located within the ROW and 2-mile wide transmission line corridor.	The disadvantage of using this alternative connector would be potential increased disturbance to habitat in two streams and aquatic species (invertebrates and game and nongame fish).

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the northern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The impacts associated with constructing and operating these alternative systems are related to predominance of intermittent streams within the boundaries for these areas. All of the electrode system alternatives contain intermittent streams and no perennial waterbodies. Potential impacts to intermittent streams would only affect aquatic species if water is present. Short-term impacts could affect macroinvertebrates in 2 to 68 intermittent streams (**Table 3.9-10**). Surface disturbance near Eight Mile Lake (Eight Mile Basin Alternative) would represent a risk for sedimentation on water quality. Erosion control measures would be implemented as part of construction to reduce sediment impact to the lake.

Table 3.9-10 Summary of Region I Alternative Ground Electrode System Impact Indicators

Electrode System	Perennial Crossings	Intermittent Crossings	Total Stream Crossings	Water Use (Acre-Ft)
Separation Flat (All Alterative Routes)	0	25	25	10
Shell Creek (Alternatives I-A and I-D)	0	68	68	25
Little Snake East (Alternatives I-A, I-B, and I-D)	0	16	16	7

Table 3.9-10 Summary of Region I Alternative Ground Electrode System Impact Indicators

Electrode System	Perennial Crossings	Intermittent Crossings	Total Stream Crossings	Water Use (Acre-Ft)
Little Snake West (Alternative I-A)	0	15	15	7
Shell Creek (Alternative I-B)	0	62	62	20
Pio Springs (Alternative I-D)	0	12	12	4
Eight Mile Basin (All Alternatives)	0	7	7	3
Separation Creek (All Alternatives)	0	2	2	10

Region I Conclusion

Based on a comparison of impact parameters for Region I alternatives, potential impacts to aquatic biological resources would be greatest for Alternative I-C. Potential effects for Alternatives I-A, I-B, and I-D (Agency Preferred) would be similar and relatively low compared to Alternative I-C (**Table 3.9-7**). Alternative I-C could result in the greatest alteration or loss of habitat (3,600 feet^2 or 0.08 acre) compared to no loss or alternation of habitat for the other three alternatives. Even though there are differences in potential habitat effects, less than 0.1 percent of available game fish species habitat would be affected for each of the four alternatives. Alternative I-C could result in the highest potential construction disturbance to riparian areas near perennial streams (22 acres at a 100-foot buffer distance and 59 acres at a 300-foot buffer distance) compared to the other three alternatives (3 to 4 acres at the 100-foot buffer distance and 6 to 7 acres at the 300-foot buffer distance) (**Table 3.9-8**). Even though the greatest level of impacts are associated with Alternative I-C, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.3 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.4 Region II

Tables 3.9-11 and **3.9-12** provide a summary of impact parameters used to describe impacts for alternative routes in Region II. Game fish occurrences for Region II's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-6** for streams and **Table G-7** for waterbodies.

The road density analysis for Region II alternatives is discussed in Section 3.4, Water Resources, with results provided in **Table 3.4-11**. These results would apply to perennial streams as aquatic habitat for game fish and other aquatic species.

Table 3.9-11 Summary of Region II Alternative Route Impact Parameters for Aquatic Biological Resources

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	26	27	29	26	39	30
Number of Game Fish Streams Crossed by 250-foot-wide ROW	14	11	13	17	13	12
Number of Game Fish Stream 250-foot-wide ROW Crossings	14	16	13	18	21	18

Table 3.9-11 Summary of Region II Alternative Route Impact Parameters for Aquatic Biological Resources

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Potential Aquatic Habitat Alteration or Loss[2] (feet^2)	10,000	19,600	22,000	7,200	17,600	7,200
Potential Aquatic Habitat Alteration or Loss (acres)	0.23	0.45	0.51	0.17	0.40	0.17
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Number of Reservoirs/Lakes Located within the 2-mile Transmission Line Corridors	4	4	3	5	3	4
Number of Springs Located within the 2-mile Transmission Line Corridors	6	7	5	2	7	5

[1] Additional unnamed perennial streams may be crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Duchesne, Green, Price, Sevier, and White.

Table 3.9-12 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region II

	Alternatives											
	II-A		II-B		II-C		II-D		II-E		II-F	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams												
Construction	40	102	53	126	39	105	33	110	99	273	46	126
Operation	14	38	15	38	10	28	11	34	26	72	18	51
Reservoirs/Lakes/Springs												
Construction	7	19	3	8	7	15	1	2	8	21	1	6
Operation	2	5	1	3	2	4	<1	1	1	4	<1	2

Potential ground disturbance effects associated with the construction and operation of Region II alternative ROWs on riparian habitat at 100 and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-12**. The highest level of potential riparian disturbance is indicated for Alternative II-E. By following stipulations for BLM FOs and USFS restrictions involving no disturbance or a buffer protection of 100 to 500 feet (see **Appendix C**), impacts on riparian vegetation would be avoided.

Alternative II-A (Applicant Proposed)

Key Parameters Summary

Alternative II-A would cross 26 named perennial streams. Fourteen of these streams contain game fish species: Bennie Creek, Currant Creek (3 crossings – one each in Duchesne, Juab, and Wasatch counties), Duchesne River, Green River, Hop, Lake Fork, Nebo Creek, Red Creek, Salt Creek (2 crossings), Soldier Creek (2 crossings), Strawberry River (2 crossings), Thistle Creek, Tie Fork, and

Willow Creek. The Strawberry River has been designated a Blue Ribbon Fishery. Potential habitat loss due to possible use of culverts, low water crossings, or temporary disturbance from instream use of equipment would be 10,000 ft^2 (0.23 acre). Large rivers such as the Green were excluded from the habitat loss estimate. Four reservoirs/lakes (Box Elder Reservoir, Box Elder Reservoir 2, and Box Elder 3 in Moffat County, Colorado; and Starvation Reservoir in Duchesne County, Utah) and six springs are located within the Alternative II-A 2-mile transmission line corridor. All four reservoirs contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 26 perennial stream crossings. There could be temporary reductions in macroinvertebrates in streams where vehicle crossings or culverts are required. Water use for concrete foundations and construction dust control would be 192 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

The Strawberry IRA (segments 320.101 through 320.103) micro-siting options 1 through 3 would not substantially affect aquatic biological resources in comparison to segment 320.10. Similarly, the Cedar Knoll IRA (segments 320.151 and 320.152) micro-siting options 1 and 2 would not substantially affect aquatic biological resources in comparison to segment 320.15.

USFS MIS

In total, six perennial streams (Sheep, Soldier [2 crossings], Tie Fork, Willow, and Salt creeks and the Strawberry River) are located within the Alternative II-A 2-mile transmission line corridor in one National Forest (Uinta-Wasatch-Cache) (**Appendix G**, **Table G-13**). Four of these streams (Soldier, Tie Fork, and Willow creeks and the Strawberry River) contain MIS (Bonneville cutthroat trout and Colorado River cutthroat trout).Three of the streams are crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 1,200 ft^2 (0.03 acre), if culverts or low water construction is required.

<u>Alternative II-B</u>

Key Parameters Summary

Alternative II-B would cross 27 named perennial streams. Eleven of these streams contain game fish species: Bitter Creek, Dry Pole Creek, Green River (2 crossings), Huntington Creek (2 crossings), Lowry River, North Fork Pleasant Creek, Pleasant Creek, Price River, San Pitch River, Sevier River (2 crossings), and the White River. Potential aquatic habitat loss would be 19,600 ft^2 (0.45 acre). Large rivers such as the Green Price, Sevier, and White were excluded from the habitat loss estimate. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the 11 game fish streams. Four reservoirs/lakes (Cactus Reservoir in Rio Blanco County, Colorado; Huntington Reservoir and Potters Pond in Emery County, Utah; and Dog Valley Reservoir in Juab County, Utah) and seven springs are located within the Alternative II-B 2-mile transmission line corridor. Except for Dog Valley Reservoir, these reservoirs or ponds contain game fish species. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 27 perennial stream crossings. There could be temporary reductions in macroinvertebrates in streams where vehicle crossings or culverts are required. Water use for concrete foundations and construction dust control would be 258 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-B. After implementing the BMPs, design features, and additional mitigation measures, there

would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

USFS MIS

In total, six perennial streams (Deer, Dry Pole, Indian, North Fork Coal, and Straight Fork creeks and the Lowry River), one spring, and one pond are located within the Alternative II-B 2-mile transmission line corridor in one National Forest (Manti-LaSal) (**Appendix G**, **Table G-13**). The MIS group, macroinvertebrates, occurs in all of these waterbodies. Two streams contain fish MIS (Bonneville cutthroat trout in Dry Pole Creek and Colorado River cutthroat trout in the Lowry River). Based on four 250-foot-wide transmission line ROW crossings of streams, there could be a direct loss of aquatic habitat of 1,600 ft^2 (0.04 acre), if culverts or low water construction is required.

The Strawberry IRA and Cedar Knolls IRA micro-siting adjustments would not substantially affect the impact analysis for aquatic biological resources.

Alternative II-C

Key Parameters Summary

Alternative II-C would cross 29 named perennial streams. Thirteen of these streams contain game fish species: Blackham Creek, Bitter Creek, Gooseberry Creek, Green River (2 crossings), Ivie Creek, Meadow Creek, Little Creek, Lost Creek, Niotche Creek, Sevier River (2 crossings), White River, Willow Creek, and Yogo Creek. Potential aquatic habitat loss would be 22,000 ft^2 (0.51 acre). Large rivers such as the Green and White were excluded from the habitat loss estimate. Three reservoirs/lakes (Cactus Reservoir in Rio Blanco County, Colorado; Saleratus Reservoir in Sevier County, Utah; and Scipio Lake in Millard County, Utah) and five springs are located within the Alternative II-C 2-mile transmission line corridor. Game fish are present in these three reservoirs/lakes. Mitigation measures **AB-1** and **AB-2** would avoid adverse effects on fish passage and game fish spawning in the game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 29 perennial stream crossings. There could be temporary reductions in macroinvertebrates at streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 272 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area of disturbance associated with a culvert.

The Strawberry IRA micro-siting adjustments would not substantially affect the impact analysis for aquatic biological resources.

USFS MIS

In total, six perennial streams (Ivie, Little, Meadow, Niotche, Phara, and Saleratus creeks), one reservoir, and four springs are located within the Alternative II-C 2-mile transmission line corridor in one national forest (Fishlake) (**Appendix G**, **Table G-13**). Four of these streams (Ivie, Little, Meadow, and Niotche creeks) contain MIS (brown, cutthroat, or rainbow trout). Two of the streams are crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 800 ft^2, if culverts or low water construction is required.

Alternative II-D

Key Parameters Summary

Alternative II-D would cross 26 named perennial streams, with 17 streams containing game fish species. Each of these streams would be crossed once by the ROW: Argyle Creek, Gooseberry Creek, Cottonwood Creek (Emery County, Utah), Green River, Hop Creek, Huntington Creek, North Fork Gordon Creek, Minnie Maud Creek, Mud Creek, Oak Creek, Price River, Salt Creek, San Pitch River, Soldier Creek, Upper Huntington Creek, White River, and Willow Creek. Potential aquatic habitat loss would be 7,200 ft^2 (0.17 acre). Large rivers such as the Green and White were excluded from the habitat loss estimate. Five reservoirs/lakes and two springs are located within the Alternative II-D 2-mile transmission line corridor. The reservoir/lakes include Box Elder, Box Elder 2, and Box Elder 3 in Moffat County, Colorado; Boulger Reservoir in Sanpete County, Utah; and Electric Lake in Emery County, Utah. Game fish are present in all five of these reservoirs/lakes. Mitigation measures **AB-1** and **AB-2** would avoid adverse effects on fish passage and game fish spawning in the game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 26 perennial stream crossings. There could be temporary reductions in macroinvertebrates at streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 195 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-D. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area of disturbance associated with a culvert.

USFS MIS

Seven streams (Cottonwood, Dry, Gooseberry, Huntington, Maple Fork, Upper Huntington, and White Pine Fork) and two reservoirs (Boulger Reservoir and Electric Lake) in the Manti-LaSal NF occur within the Alternative II-D 2-mile transmission line corridor (**Appendix G**, **Table G-13**). All of these waterbodies contain the MIS group, macroinvertebrates. Two streams (Huntington and Cottonwood creeks) contain fish MIS, Bonneville cutthroat trout and Colorado River cutthroat trout, respectively. Six streams are crossed by the 250-foot-wide transmission line ROW, which could result in direct loss of aquatic habitat of 2,400 ft^2, if culverts or low water construction is required.

Alternative II-E

Key Parameters Summary

Alternative II-E would cross 39 named perennial streams, with 13 streams containing game fish species. Several of these streams would be crossed multiple times, with a total of 21 ROW crossings for this alternative. The number of ROW crossings by game fish stream would include Argyle Creek (3), Beaver Creek (1), Duchesne River (1), Green River (1), Hop Creek (1), Lake Fork Creek (1), Lake Fork River (1), Price River (2), Soldier Creek (5), Tabbyune Creek (1), Thistle Creek (1), Tie Fork Creek (1), and Willow Creek (2). Four additional streams (Bennie, Nebo, Tabbyune, and the White River) are located within the 2-mile transmission line corridor. Potential aquatic habitat loss would be 17,600 ft^2 (0.4 acre). Large rivers such as the Duchesne, Green, Price, and White were excluded from the habitat loss estimate. Three reservoirs/lakes (Box Elder Reservoir, Box Elder Reservoir 2, and Box Elder Reservoir 3 in Moffat County, Colorado) and seven springs are located within the Alternative II-E 2-mile transmission line corridor. Game fish occur in these three reservoirs. The same BMPs, design features, and mitigation measures discussed for other Region II alternatives would be applied to Alternative II-E. Water use for concrete foundations and construction dust control would be 199 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-E. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species, other than the small area of disturbance associated with a culvert.

The Strawberry IRA and Cedar Knoll IRA micro-siting options would not substantially affect aquatic biological resources in comparison to the comparable segments of Alternative II-E.

USFS MIS

The Alternative II-E 2-mile transmission line corridor overlaps with waterbodies in the following national forests: Uinta-Wasatch-Cache (Indian, Sheep, and Tie Fork creeks), Manti-LaSal (Long Hollow, Lookout, and Sky High springs), and Ashley (Sowers Creek). MIS occurrence includes Bonneville cutthroat trout in Tie Fork Creek and macroinvertebrates in Sowers Creek. Potential direct loss of aquatic habitat includes 1,200 ft^2 (0.03 acre) in the Uinta-Wasatch-Cache National Forest and 400 ft^2 (0.01 acre) in the Ashley National Forest, if culverts or low water construction is required. No habitat loss would occur in the Manti-LaSal National Forest, since the 250-foot-wide transmission line ROW does not cross the three springs.

Alternative II-F (Agency Preferred)

Key Parameters Summary

A total of 30 named perennial streams are located within the Alternative II-F 2-mile transmission line corridor. Game fish species occur in 21 of the streams located within the 2-mile transmission line corridor. Three reservoirs and eight springs also are located within the 2-mile transmission line corridor. The reservoirs contain game fish species (Box Elder, Box Elder Number 2, and Box Elder Number 3). Twelve game fish streams are crossed by the 250-foot-wide transmission line ROW, with a total of 18 crossings when considering multiple stream crossings. The number of ROW crossings by stream would include Argyle Creek (2), Green River (1), Hop Creek (1), Lake Fork Creek (1), Sevier River (2), Soldier Creek (5), Tabbyune Creek (1), Thistle Creek (1), Tie Fork Creek (1), White River (1), White River Right Fork (1), and Willow Creek (1). Potential habitat loss due to the addition of a culvert or equipment disturbance during low water construction would be approximately 9,600 ft^2 (0.22 acre). Large rivers such the Green, Sevier, and White were excluded from this estimate. Three reservoirs (Box Elder, Box Elder #2, and Box Elder #3 in Moffat County, Colorado) and five springs are located within the 2-mile transmission line corridor. All three reservoirs contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning periods in the game fish streams. The same BMPs, design features, and mitigation measures discussed for the other alternatives would be implemented to minimize water quality effects on aquatic habitat and species. Water use for concrete foundations and construction dust control would be 199 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects other than the small area of disturbance associated with a culvert.

The Strawberry IRA and Cedar Knoll IRA micro-siting options would not substantially affect aquatic biological resources in comparison to the comparable segments of Alternative II-F.

USFS MIS

The Alternative II-F transmission line corridor crosses five streams in the Uinta-Wasatch-Cache NF (Indian, Sheep, Tie Fork, Soldier, and Salt creeks) and three springs (Long Hollow, Lookout, and Sky High) in the Manti-LaSal National Forest (**Appendix G**, **Table G-13**). The MIS, Bonneville cutthroat trout, occurs in two streams: Tie Fork and Soldier creeks. Both streams are crossed by the 2-mile transmission line corridor, while Tie Fork Creek is also crossed by the 250-foot-wide transmission line ROW. Potential direct loss of habitat would be 400 ft^2 (0.01 acre), if a culvert or low water construction is required.

Alternative Variation in Region II

Emma Park Alternative Variation

Potential impacts of constructing the Emma Park Alternative Variation on aquatic biological resources would be similar to the comparable portion of Alternative II-F, based on the number of perennial streams located within the 2-mile transmission line corridors. In total, seven streams (Horse, Kyune, Kyune Right Fork, Tabbyune, Willow, and Bear creeks and White River Fork) are located within the 2-mile transmission line corridor compared to six streams (same as Emma Park Alternative Variation except for Horse Creek) for the comparable portion of Alternative II-F. Five of the streams contain game fish species (Kyune, Kyune Right Fork, Tabbyune, and Willow creeks and White River Right Fork) for both the Emma Park Alternative Variation and Alternative II-F comparable portion. There would be a slightly greater risk of sediment input to Kyune and Tabbyune creeks as a result of the 250-foot-wide transmission line ROW crossings by the Emma Park Alternative Variation. However, erosion control measures would be implemented to reduce sediment-related impacts for the Emma Park Alternative Variation and Alternative II-F.

Alternative Connectors in Region II

The Castle Dale and IPP East alternative connectors do not cross perennial streams. **Table 3.9-13** summarizes impacts and advantages associated with the Price and Highway 191 alternative connectors in Region II.

Table 3.9-13 Summary of Region II Alternative Connector Impacts for Aquatic Biological Resources

Alternative Connector	Analysis	Advantage
Price	There are two perennial streams (Miller and South Gordon creeks) within the 250-foot-wide transmission line ROW. These streams do not support game fish species.	There are no apparent unique opportunities or constraints for aquatic biological resources by utilizing this connector.
Highway 191	One perennial stream (Willow Creek) is crossed by this connector's 250-foot-wide transmission line ROW. This stream contains brown trout.	There is no apparent unique opportunities or constraints for aquatic biological resources by utilizing this connector.

USFS MIS

No National Forest System lands are crossed by the variations in Region II.

Region II Conclusion

Based on a comparison of potential habitat disturbance for Region II alternatives, potential impacts to aquatic biological resources would be greatest for Alternatives II-B, II-C, and II-E. Potential effects for Alternatives II-A, II-D, and II-F (Agency Preferred) would be similar and lower compared to Alternatives II-B, II-C, and II-E (**Table 3.9-11**). Alternatives II-B, II-C, and II-E could result in the greatest potential alteration or loss of habitat (17,600 to 22,000 ft^2 or 0.4 to 0.51 acre) compared to 7,200 to 10,000 ft^2 or 0.17 to 0.23 acre for Alternatives II-A, II-D, and II-F. Even though there are differences in potential habitat effects, less than 0.1 percent of the available game fish species habitat would be affected for each of the six alternatives. Alternative II-E could result in the highest potential construction disturbance to riparian areas near perennial streams (99 acres at a 100-foot buffer distance and 273 acres at a 300-foot buffer distance) (**Table 3.9-12**). Potential disturbance to riparian habitat for the other five alternatives were similar and less compared to Alternative II-E. Alternative II-F (Agency Preferred) ranked in the middle portion of the riparian disturbance estimates. Even though the greatest level of impacts are

associated with Alternatives II-B, II-C, and II-E, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.4 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.5 Region III

Tables 3.9-14 and **3.9-15** provide a summary of impact parameters used to describe impacts for alternative routes in Region III. Game fish occurrences for Region III's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-8** for streams and **Table G-9** for waterbodies.

Table 3.9-14 Summary of Region III Alternative Route Impacts for Aquatic Biological Resources

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	4	3	1
Number of Game Fish Streams Crossed by 250-foot-wide ROW	0	2	1
Number of Game Fish Stream 250-foot-wide ROW Crossings	0	2	1
Potential Aquatic Habitat Alteration or Loss[2] (ft^2)	1,600	1,200	400
Potential Aquatic Habitat Alteration or Loss (acres)	0.04	0.03	0.01
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	<0.1	<0.1	<0.1
Number of Reservoirs/Lakes Located within the 2-mile Transmission Line Corridors	3	7	4
Number of Springs Located within the 2-mile Transmission Line Corridors	16	9	10

[1] Additional unnamed perennial streams may be crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment.

Table 3.9-15 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region III

	Alternatives					
	III-A		III-B		III-C	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams						
Construction	5	17	3	8	<1	<1
Operation	2	5	1	2	<1	<1
Reservoirs/Lakes/Springs						
Construction	3	5	3	4	3	5
Operation	1	1	1	1	1	1

The road density analysis for Region III alternatives is discussed in Water Resources, Section 3.4, with results provided in **Table 3.4-14**. These results would apply to perennial streams as aquatic habitat for game fish and other aquatic species.

Potential ground disturbance effects associated with the construction and operation of Region III alternative ROWs on riparian habitat at 100- and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-15**. The highest level of potential riparian disturbance is indicated for Alternatives III-A and III-B. By complying with stipulations for BLM FOs that prohibit surface disturbance within 328 feet of streams and lakes (see **Appendix C**), impacts on riparian vegetation would be avoided.

Alternative III-A (Applicant Proposed)

Key Parameters Summary

Alternative III-A would cross four named perennial streams. None of the perennial streams crossed by this alternative contain game fish species. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 1,600 ft^2 (0.04 acre), if culverts or low water construction is required. Three reservoirs/lakes (Smelter Knolls Reservoir in Millard County, Utah; Lower Big Wash Reservoir in Beaver County, Utah; and Newcastle Reservoir in Iron County, Utah) and sixteen springs are located within the Alternative III-A 2-mile transmission line corridor. One of these waterbodies (Newcastle Reservoir) contains game fish species. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates in streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 206 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region III, Alternative III-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

USFS MIS

In total, two perennial streams (Magotsu and Spring creeks) and six springs are located within the Alternative III-A 2-mile transmission line corridor in the Dixie National Forest (**Appendix G, Table G-13**). Both streams (Magotsu and Spring creeks) contain MIS Virgin spinedace. No MIS occur in the springs. Both streams are crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 800 ft^2 (0.02 acre), if culverts or low water construction is required.

Alternative III-B (Agency Preferred)

Key Parameters Summary

Alternative III-B would cross three named perennial streams. Two of the perennial streams (Clover Creek and Meadow Valley Wash) are crossed by the 2-mile transmission line corridor and the 250-foot-wide ROW. Meadow Valley Wash also is crossed by the 250-foot-wide transmission line ROW. These streams contain game fish species (rainbow trout) and nongame native fish species. Potential habitat loss would be 1,200 ft^2 (0.03 acre), if culverts or low water construction is required. Seven reservoirs/lakes and nine springs are located within the Alternative III-B 2-mile transmission line corridor. The reservoirs/lakes include Smelter Knolls, West Clay Knoll, and West Marshall Tract reservoirs in Millard County, Utah; Lower Big Wash Reservoir in Beaver County, Utah; and Rolling Hills, Jacks Canyon, and Lafes reservoirs in Lincoln County, Nevada. None of the waterbodies contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the two game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates in streams with substrate

disturbance. Water use for concrete foundations and construction dust control would be 212 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region III, Alternative III-B. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than a small area associated with a culvert.

USFS MIS

No National Forest System lands are crossed by the Alternative III-B 2-mile transmission line corridor or 250-foot-wide transmission line ROW (**Appendix G**, **Table G-13**).

Alternative III-C

Key Parameters Summary

Alternative III-C would cross one named perennial stream, Meadow Valley Wash, which contains game fish species (rainbow trout). Potential habitat loss would be 400 ft^2 (0.01 acre). Four reservoirs/lakes (Smelter Knolls, West Clay Knoll, and West Marshall Tract reservoirs in Millard County, Utah; and Lower Big Wash Reservoir in Beaver County, Utah) and 10 springs are located within the Alternative III-C 2-mile transmission line corridor. None of these waterbodies contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the one game fish stream. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates in streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 230 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region III, Alternative III-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

USFS MIS

No National Forest System lands are crossed by the Alternative III-C 2-mile transmission line corridor or 250-foot-wide transmission line ROW.

Alternative Variations in Region III

Table 3.9-16 provides a comparison of impacts associated with the alternative variations in Region III. The number of perennial streams crossed by the Ox Valley East and West Variations is one compared to one perennial stream by the comparable portion of Alternative III-A. These streams (Spring and Magotsu creeks) do not contain game fish species. Potential road crossings of these streams could result in habitat alteration and potential water quality impacts. Five perennial streams (South Fork Pinto, Little Pinto, Magotsu, and Pinto creeks, and the Santa Clara River) are located within the 2-mile transmission line corridor, with 8 crossings of the 250-foot-wide transmission line ROW. Three of these streams (South Pinto Creek, Pinto Creek, and the Santa Clara River) contain game fish. The comparable portion of the Alternative III-A Alternative crosses one perennial stream (Spring Creek). BMPs and design features would minimize impacts to aquatic habitat and species. There would be slightly higher risk to amphibian mortalities during construction for the two variations due to the higher ROW mileage. These potential impacts to amphibians would be short-term in duration and expected to cause relatively low mortality numbers.

Table 3.9-16 Summary of Region III Alternative Variation Impacts for Aquatic Biological Resources

Parameter	Ox Valley East Alternative Variation	Comparable Portion of Alternative III-A	Ox Valley West Alternative Variation	Comparable Portion of Alternative III-A	Pinto Alternative Variation	Comparable Portion of Alternative III-A
Number of Named Perennial Streams[1] Crossings by 250-foot-wide transmission line ROW	1	1	1	1	8	1
Number of Game Fish Streams Crossed by 250-foot-wide transmission line ROW	0	0	0	0	1	0
Number of Game Fish Streams Crossed by 2-mile Transmission Line Corridors	0	0	0	0	1	0

[1]Additional unnamed perennial streams are crossed by the 250-foot-wide transmission line ROWs.

USFS MIS

Waterbodies that occur within Region III variations on Dixie National Forest lands are listed in **Appendix G**, **Table G-14**. The following alternative variations overlap with waterbodies in the Dixie National Forest:

- Ox Valley East – 2 streams and 6 springs with MIS (Virgin spinedace) in Spring Creek;
- Ox Valley West – 1 stream with MIS (Virgin spinedace) in Spring Creek;
- Ox Valley East and West – 1 stream and 3 springs with no MIS; and
- Pinto – 5 streams and 4 springs with MIS in Magotsu Creek (Virgin spinedace), South Fork Pinto Creek (rainbow trout), Pinto Creek (rainbow trout), and Santa Clara River (brook, brown, and rainbow trout).

Alternative Connectors in Region III

The Avon and Moapa Alternative Connectors does not cross perennial streams.

Alternative Ground Electrode Systems in Region III

The southern ground electrode system would be necessary within 100 miles of the southern terminal. Conceptual locations and connections are analyzed. Impacts associated with the construction and operation of this system would be the same as discussed for Alternative I-A. **Table 3.9-17** provides a comparison of alternative electrode bed locations proposed near the southern terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route. Impacts on aquatic biological resources would be limited to intermittent streams. Macroinvertebrate communities could be affected on a short-term basis if water is present.

Table 3.9-17 Summary of Region III Alternative Ground Electrode System Location Impacts for Aquatic Biological Resources

	Number of Perennial	Number of Intermittent	Number of Reservoirs/ Lakes	Total Number of Waterbodies	Water Use (acre-feet)
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	0	4	8	12	4
Halfway Wash- Virgin River (Alternative III-A)	0	3	0	3	3

Table 3.9-17 Summary of Region III Alternative Ground Electrode System Location Impacts for Aquatic Biological Resources

	Number of Perennial	Number of Intermittent	Number of Reservoirs/ Lakes	Total Number of Waterbodies	Water Use (acre-feet)
Halfway Wash E (Alternative III-A)	0	12	0	12	6
Mormon Mesa- Carp Elgin Rd (Alternative III-B)	0	5	8	13	6
Halfway Wash-Virgin River (Alternative III-B)	0	3	0	3	4
Halfway Wash E (Alternative III-B)	0	1	0	1	6
Meadow Valley 2 (Alternative III-C)	0	27	0	27	16
Delta (Design Option 2)	0	16	0	16	14

[1] Estimation of water use based on assumptions provided for construction of 500-kV DC transmission line.

Region III Conclusion

Based on a comparison of impact parameters for Region III alternatives, potential impacts to aquatic biological resources would be slightly higher for Alternatives III-A (Applicant Proposed) and III-B (Agency Preferred) compared to Alternative III-C (**Table 3.9-14**). Alternatives III-A and III-B could result in the greatest potential alteration or loss of habitat (1,200 ft^2 to 1,600 ft^2 or 0.03 to 0.04 acre) compared to 400 ft^2 or 0.01 acre for Alternative III-C. Even though there are differences in potential habitat effects, less than 0.1 percent of the available aquatic habitat would be affected for each of the three alternatives. Alternatives III-A and III-B also could result in the highest potential construction disturbance to riparian areas near perennial streams (3 to 5 acres at a 100-foot buffer distance and 8 to 17 acres at a 300-foot buffer distance) compared to Alternative III-C (<1 acre for both buffer distances) (**Table 3.9-15**). Even though the greatest level of impacts are associated with Alternatives III-A and III-B, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.5 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.6 Region IV

Tables 3.9-18 provide a list of impact parameters associated with alternative routes in Region IV. Game fish occurrences for Region IV's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-10** for streams and **Table G-11** for waterbodies.

Table 3.9-18 Summary of Region IV Alternative Route Impacts for Aquatic Biological Resources

Parameter	Alternative IV-A (Applicant Proposed)	Alternative IV-B	Alternative IV-C
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	1	4	3
Number of Game Fish Streams Crossed by 250-foot-wide ROW	1	1	1
Number of Game Fish Stream 250-foot-wide ROW Crossings	1	0	0
Potential aquatic habitat alteration or loss[2] (ft^2)	400	1,600	1,200
Potential Aquatic Habitat Alteration or Loss (acres)	0.01	0.04	0.03

Table 3.9-18 Summary of Region IV Alternative Route Impacts for Aquatic Biological Resources

Parameter	Alternative IV-A (Applicant Proposed)	Alternative IV-B	Alternative IV-C
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	<0.1	<0.1	<0.1
Number of Reservoirs/Lakes Located within the 2-mile Transmission Line Corridors	1	1	4
Number of Springs Located within the 2-mile Transmission Line Corridors	0	0	0

[1] Additional unnamed perennial streams are crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment.

The road density analysis for Region IV alternatives is discussed in Water Resources, Section 3.4, with results provided in **Table 3.4-19**. These results would apply to perennial streams as aquatic habitat for game fish and other aquatic species.

Table 3.9-19 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region IV

	Alternatives					
	IV-A		IV-B		IV-C	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams						
Construction	<1	<1	2	5	1	3
Operation	<1	<1	<1	1	<1	1
Reservoirs/Lakes/Springs						
Construction	3	5	2	3	2	3
Operation	1	1	2	2	2	2

Potential ground disturbance effects associated with the construction and operation of Region IV alternative ROWs on riparian habitat at 100 and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-19**. The potential riparian disturbance associated with perennial streams would be slightly higher for Alternatives IV-B and IV-C compared to IV-A. Potential disturbance to riparian areas associated with reservoirs was slightly higher for Alternative IV-A. There are no stipulations for BLM FOs involving buffer protection for riparian areas.

<u>Alternative IV-A (Applicant Proposed and Agency Preferred)</u>

Key Parameters Summary

Alternative IV-A would cross one named perennial stream (Las Vegas Wash), which contains one warmwater game fish species, largemouth bass. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 400 feet^2 or 0.01 acre One reservoir/lake is located within the Alternative IV-A 2-mile transmission line corridor. Mitigation measure WR-1 would avoid crossing Las Vegas Wash to eliminate additional impacts to an impaired

stream. As a result of this measure, there would be no impacts on aquatic habitat and species on game fish streams for Alternative IV-A. BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat at the perennial stream crossings. There could be temporary reductions in macroinvertebrates at stream crossings. Water use for concrete foundations and construction dust control would be 28 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region IV, Alternative IV-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

Alternative IV-B

Key Parameters Summary

Alternative IV-B would cross four named perennial streams. Hemenway Wash is crossed at three locations by the 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Las Vegas Wash is crossed only by the 2-mile wide corridor. Las Vegas Wash is a game fish stream. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 1,600 ft^2 or 0.04 acre. One reservoir/lake is located within the Alternative IV-B 2-mile transmission line corridor. There would be no impacts on aquatic habitat and species in Las Vegas Wash for Alternative IV-B due to the implementation of mitigation measure WR-1 (avoid crossing impaired streams). BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates at the other stream crossings. Water use for concrete foundations and construction dust control would be 29 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region IV, Alternative IV-B. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

Alternative IV-C

Key Parameters Summary

Alternative IV-C would cross three named perennial streams (Hemenway Wash at two locations and Las Vegas Wash). Las Vegas Wash is a game fish stream. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 1,200 $feet^2$ or 0.03 acre. Four reservoirs/lakes are located within the Alternative IV-C 2-mile transmission line corridor. There would be no impacts on aquatic habitat and species in Las Vegas Wash for Alternative IV-C due to the implementation of mitigation measure WR-1 (avoid crossing impaired streams). BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates at the other stream crossings. Water use for concrete foundations and construction dust control would be 33 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region IV, Alternative IV-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

Alternative Variations in Region IV

No waterbodies are crossed by the Marketplace Alternative Variation.

Alternative Connectors in Region IV

Table 3.9-20 tabulates impacts for the alternative connectors in Region IV. There would be no impacts for the Sunrise Mountain, Lake Las Vegas, Three Kids Mine, and Railroad Pass alternative connectors.

Table 3.9-20 Summary of Region IV Alternative Connector Impacts for Aquatic Biological Resources

Alternative Connector	Analysis	Advantage
River Mountains Alternative Connector	Impacts would be limited to one stream (Hemenway Wash) crossed by this alternative.	There is a slight disadvantage in this alternative, since there would be one stream crossing with perennial reaches.

Region IV Conclusion

Based on a comparison of impact parameters for Region IV alternatives, potential impacts to aquatic biological resources would be slightly higher for Alternatives IV-B and IV-C. Potential effects for Alternatives IV-A (Applicant Proposed and Agency Preferred) would be similar and slightly lower compared to Alternatives IV-B and IV-C (**Table 3.9-18**). Alternatives IV-A and IV-B could result in the greatest potential alteration or loss of habitat (1,200 to 1,600 ft^2 or 0.03 to 0.04 acre) compared to 400 ft^2 or 0.01 acre for Alternative IV-A. Even though there are differences in potential habitat effects, less than 0.1 percent of the available aquatic habitat would be affected for each of the three alternatives. Alternatives IV-B and IV-C also could result in the slightly higher potential construction disturbance to riparian areas near perennial streams (1 to 2 acres at a 100-foot buffer distance and 3 to 5 acres at a 300-foot buffer distance) (**Table 3.9-19**). Potential disturbance to riparian habitat for Alternative IV-A would be <1 acre for both buffer distances. Even though the greatest level of impacts are associated with Alternatives IV-B and IV-C, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.6 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.7 Impacts to Aquatic Biological Resources from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No project-related disturbance would occur in waterbodies as a result of vehicle traffic or removal of riparian vegetation. No project-related sedimentation or risks to aquatic species from potential fuel spills or introduction of invasive species would occur from the Project. Impacts to aquatic habitat and species would continue at present levels as a result of natural conditions (e.g., annual fluctuations in stream flow due to varying precipitation, erosion, and wildfires) and existing development in drainages within the analysis area.

3.9.6.8 Residual Impacts

The following residual impacts would occur after implementation of BMPs, agency stipulations, design features, and additional mitigation:

- Potential loss or alteration of aquatic habitat in smaller streams that require culverts or vehicle crossings.
- Potential short-term sedimentation effects on aquatic habitat and species as a result of direct disturbance within or adjacent to streams from vehicle traffic.

- Potential loss or disturbance to riparian vegetation along streams on private lands or public lands where the ROW is parallel and adjacent to streams.
- Potential amphibian mortalities from vehicle traffic during amphibian movements to and from waterbodies located within the ROWs.

3.9.6.9 Irreversible and Irretrievable Commitment of Resources

- Potential loss of aquatic habitat in streams that require culverts for vehicle crossings would be irretrievable. However, the habitat loss would be reversible if the culvert was removed at a later time.
- Potential amphibian mortalities from vehicle traffic would be an irretrievable and irreversible loss of a portion of amphibian populations.

3.9.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

The proposed action and alternatives would result in short-term disturbance to aquatic habit but these effects would not affect the long-term productivity of fish, invertebrate, or amphibian populations.

1

3.10 Special Status Aquatic Species

3.10.1 Regulatory Background

Background information on regulatory protection for special status species is provided in Section 3.6, Special Status Plant Species. Regulations that directly influence special status aquatic species management decisions within the analysis area are primarily implemented by the BLM, USFWS, USFS, and state wildlife agencies, which consist of the WGFD, CPW, UDWR, and NDOW. Specific special status species regulations relevant to the proposed project are presented in **Table 3.10-1**.

Table 3.10-1 Relevant Regulations for Special Status Aquatic Species

Topic	Regulation
Aquatic Species (Amphibians, Fish, and Aquatic Invertebrates)	• Endangered Species Act (ESA) of 1973; • BLM Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125); • U.S. Forest Service Manual (FSM) 2670; • Colorado Revised Statutes 33-2-105; • Utah Rules R657-3, R657-19, and R657-48; and • Nevada Administrative Code 501.100-503.104.

The analysis for special status aquatic species assumed the BLM and USFS would continue to manage special aquatic status species' habitats on their lands in coordination with the applicable state wildlife agencies (i.e., WGFD, CPW, UDWR, and NDOW). The USFWS would have jurisdiction over the management of ESA-listed species.

3.10.2 Data Sources

Information regarding special status aquatic species and their habitat within the analysis area was obtained from a review of existing published sources, BLM RMPs, USFS Forest Management Plans, BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information as a result of correspondence with agency fishery biologists was incorporated into this section as appropriate.

3.10.3 Study Area

The analysis area for special status aquatic species encompasses all alternative routes and locations of other project components including terminals and ground electrodes. The analysis area included perennial streams, reservoirs, lakes, and springs that would be crossed by the alternative 250-foot-wide transmission line ROWs and 2-mile-wide transmission line corridors. A downstream reach of approximately 2 miles also was considered as part of the analysis area. This analysis area considered all special status aquatic species and their habitats that may be present, based on available literature and data reviewed for the project. For federally listed fish in the Colorado River Basin, the downstream analysis area extended for at least 10 miles to include potential water depletions. The Platte River Basin also is included in the analysis area for consideration of potential water depletions. For context, impacts are in the project analysis area are discussed in comparison to the watershed area.

3.10.4 Baseline Description

In total, 55 special status aquatic species were evaluated in terms of potential occurrence within the project analysis area. As documented in **Appendix G**, **Table G-3**, 27 species were eliminated from further consideration in this EIS because of a lack of habitat or documented occurrence within the project analysis area. Species carried forward in this EIS include 20 fish, 5 amphibians, and 3 invertebrates (**Table 3.10-2**).

Table 3.10-2 Special Status Aquatic Species Analyzed for the TransWest Express Transmission Project

Common Name	Scientific Name	Status[1]
Arizona toad	*Bufo microscaphus*	BLM; UTSC; CAS
Boreal toad	*Bufo boreas boreas*	FS; CO-E; CAS
Columbia spotted frog	*Rana luteiventris*	FS; NV-P; UTSC
Great Basin spadefoot toad	*Spea intermontana*	BLM
Northern leopard frog	*Rana pipiens*	BLM; NV-P
Bluehead sucker	*Catostomus discobolus*	BLM; CAS
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	BLM; FS; UTSC; CAS
Bonytail (CH)[3]	*Gila elegans*	FE; BLM
Colorado pikeminnow (CH)[3]	*Ptychocheilus lucius*	FE; BLM
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	BLM; FS; CAS
Flannelmouth sucker	*Catostomus latipinnis*	BLM; CAS
Humpback chub (CH)[3]	*Gila cypha*	FE, BLM
June sucker	*Chasmistes liorus*	FE; BLM; UTSC
Least chub	*Iotichthys phlegethontis*	FC; BLM; UTSC; CAS
Meadow Valley Wash desert sucker	*Catostomus clarkii* spp.	BLM; NV-P
Meadow Valley Wash speckled dace	*Rhinicthys osculus* subspecies	BLM
Moapa speckled dace	*Rhinichthys osculus moapae*	NV
Moapa White River springfish	*Crenichthys baileyi moapae*	NV
Mountain sucker	*Catostomus platyrhynchus*	BLM
Pallid sturgeon[2]	*Scaphirhynchus antillarum*	FE
Razorback sucker (CH)[3]	*Xyrauchen texanus*	FE; BLM
Roundtail chub	*Gila robusta robusta*	BLM
Southern leatherside chub	*Lepidomeda aliciae*	BLM; FS; CAS
Virgin River chub	*Gila robusta seminuda*	FE; BLM
Virgin River spinedace	*Lepidomeda mollispinis mollispinis*	BLM, NV; CAS
California floater	*Anodonta californiensis*	BLM
Moapa Warm Spring riffle beetle	*Stenelmis moapa*	BLM
Southern Bonneville pyrg	*Pyrgulopsis transversa*	UTSC

[1] Status: FE = Federally Endangered; FT = Federally Threatened; FP = Federally Petitioned; BLM = BLM Sensitive; FS = Forest Sensitive; CO-E = Colorado Endangered; NV-P = Nevada State Protected; UTSC = Utah Special Concern; CAS = Utah Conservation Agreement Species.

[2] Species is included because of the water depletion evaluation requirement in the Platte River Basin.

[3] Critical habitat is located within and/or downstream of the analysis area.

In total, seven federally listed fish species were analyzed. Except for pallid sturgeon, their occurrence within the analysis area is shown in **Figure 3.10-1**. A summary of the listing status, habitat, and general distribution for the federally listed and candidate aquatic species are provided below.

Aquatic habitat in the analysis area used by special status aquatic species includes streams, springs, and wetlands. No lakes or reservoirs are inhabited by special status aquatic species. Stream habitats range from small channels with widths less than 10 feet to large rivers such as the Green, White, and Yampa. Habitat conditions vary depending on flow, gradient, channel configuration, water depth, substrate composition,

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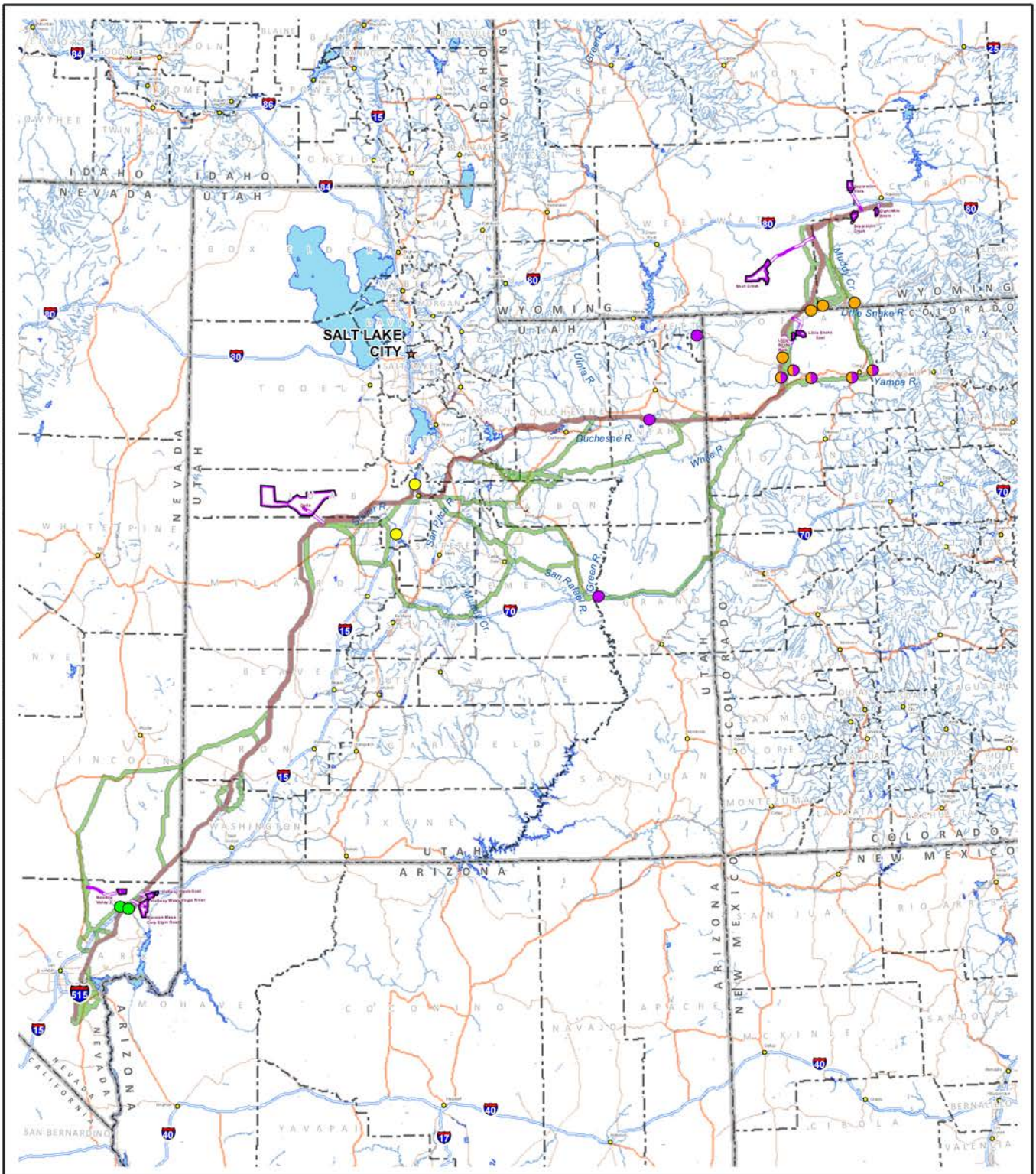

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presence of pools, runs, and riffles, types of instream cover, and extent of riparian vegetation. Specific habitat conditions for waterbodies with special status aquatic species that are located within the analysis area are not described in this section, since information is lacking for most of the proposed waterbody crossings. Instead, reference is made to habitat preferences for federally listed and candidate species and species with conservation agreements, which are identified in Section 3.10.4.1. Habitat information also is provided for all special status aquatic species in **Appendix G**, **Table G-3**.

3.10.4.1 Federally Listed and Candidate Aquatic Species

Bonytail (Federally Endangered)

The USFWS determined the species to be endangered in 1980 (45 FR 27710). In 1994 the USFWS designated seven reaches of the Colorado River system, including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and the Colorado River in the Lower Basin, totaling 312 miles of critical habitat for the species (59 FR 13374). A recovery plan was published for bonytail in 2002 (USFWS 2002a). The upper basin recovery subunit is composed of the Green River and upper Colorado basin and the lower basin recovery subunit includes the mainstem and tributaries of the Colorado River from Lake Mead downstream to the southerly International Boundary with Mexico. The general types of habitat used by bonytail include mainstem riverine areas and impoundments in the Colorado River system. Deep pools and eddies with slow to fast currents are characteristic of the riverine habitat (Kaeding et al. 1986). It is assumed that spawning occurs in June or July (Maddux et al. 1993).

Known occurrence includes the Yampa River in Dinosaur National Monument, the Green River in Gray and Desolation canyons, the Colorado River near Black Rocks (Kaeding et al. 1986) and Cataract Canyon (59 FR 13374), Lake Mohave near the Arizona-Nevada border, and Lake Havasu in Arizona and California (USFWS 2002a). No occupied or critical habitat would be crossed by project 250-foot-wide transmission line ROWs or 2-mile transmission line corridors. The closest known population is the Desolation and Gray Canyon areas in the Green River in Utah, which are approximately 55 and 120 miles, respectively, downstream and approximately 15 miles upstream of the closest alternative transmission line corridors.

Colorado Pikeminnow (Federally Endangered)

This species (originally named Colorado squawfish) was listed as endangered under the Endangered Species Act (ESA) on March 11, 1967 (32 FR 4001). With the 1973 passage of the ESA, the fish retained its endangered status. On March 21, 1994 the USFWS designated six reaches of the Colorado River system, including portions of the Colorado, Green, Yampa, White, and San Juan rivers, totaling 1,148 miles of critical habitat for the species (59 FR 13374). Two reintroduced Colorado pikeminnow populations have been designated as Nonessential Experimental under Section 10(j) of the ESA (50 FR 30188). A recovery plan for this species was published in 2002 (USFWS 2002b). The entire population of the Colorado pikeminnow has been reduced to three recovery subunits in the upper Colorado River Basin: the Green River, the upper Colorado River, and the San Juan River subbasins. Habitat requirements of Colorado pikeminnow vary depending on the life stage and time of year. Young-of-the-year (YOY) and juveniles prefer shallow backwaters, while adults use pools, eddies, and deep runs (Miller et al. 1982). During peak runoff in the spring and early summer, fish usually move into backwater areas of flooded riparian zones to avoid swift velocities, feed, and prepare for the upcoming spawning period. Adults are highly mobile during the spawning period, which occurs after peak runoff in mid-June to mid-August.

Colorado pikeminnow occurs within three subbasins and includes the following rivers: Green River subbasin (Green, Yampa, Little Snake, White, Price, and Duchesne), Upper Colorado subbasin (Upper Colorado, Gunnison, and Dolores), and San Juan (San Juan River). The 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross occupied habitat in the Yampa and Little Snake rivers. Critical habitat would be crossed by project 250-foot-wide transmission line ROWs in the Green, White, and Yampa rivers. Occupied habitat also is located downstream of 250-foot-wide transmission line ROWs and corridors in the Colorado River and tributaries near the confluence with the Colorado River and the Price and White

rivers. The only two known spawning sites of the species are located downstream of project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors at Three Fords Canyon in the Gray Canyon area of the Green River (Carbon and Uintah counties, Utah) and the lower 20 miles of the Yampa River (Moffat County, Colorado).

Humpback Chub (Federally Endangered)

The dates for listing humpback chub are the same as discussed for Colorado pikeminnow. On March 21, 1994, the USFWS designated seven reaches of the Colorado River system including portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and portions of the Colorado and Little Colorado Rivers in the Lower Basin, totaling 379 miles of critical habitat for the species (59 FR 13374). The current recovery plan for the humpback chub was published in 1990 and amended in 2002 (USFWS 2002c). Humpback chub mainly occur in river canyons where they utilize a variety of habitats including deep pools, eddies, upwells near boulders, and areas near steep cliff faces. Young and spawning adults are generally found in sandy runs and backwaters (USFWS 1990). Spawning occurs in May through July after peak spring flows.

Currently, there are six known self-sustaining populations. Five occur in the Upper and one on the Lower Basin Recovery Units. The Upper Recovery Unit consists of populations on the Colorado River (Black Rocks and Westwater Canyon in Utah and Cataract Canyon in Colorado), one population on the Yampa River (Yampa Canyon in Colorado), and on the Green River (Desolation/Gray Canyons in Utah). The only population in the Lower Basin Recovery Unit occurs on the mainstem Colorado River in Marble and Grand Canyons and the Little Colorado River. No occupied or critical habitat would be crossed by the alternative 250-foot-wide transmission line ROWs or 2-mile transmission line corridors. Occupied and critical habitat exists downstream of the project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors in the Colorado, Yampa, and Green rivers.

June Sucker (Federally Endangered)

The June sucker was federally listed in 1986 (USFWS 1986). This species is endemic to Utah Lake in Utah and uses the lower portion of the Provo River for spawning and early life stage development. A recovery plan was finalized for this species in 1999, with actions being implemented from 1995 through 2007 (USFWS 1999, 2012a). The lake and lower portion of the Provo River were designated as critical habitat for the June sucker. Utah Lake is a relatively large and shallow lake with slightly saline, turbid, and eutrophic conditions. June sucker adults leave Utah Lake and swim up the Provo River in June of each year (UDWR 2012a). Spawning occurs in shallow riffles over gravel or rock substrate. No occupied or critical habitat would be crossed by project 250-foot-wide transmission line ROWs or 2-mile transmission line corridors.

Least Chub (Federal Candidate)

The least chub was petitioned for listing under the ESA in 2007. The USFWS conducted a 12-month status review and released their finding in June 2010 (USFWS 2010). The USFWS determined that the status was “warranted but precluded” and it was identified as a candidate species. The species is endemic to the Bonneville Basin of Utah where it was once widely distributed and occupied a variety of habitats including rivers, streams, springs, ponds, marshes, and swamps (Sigler and Sigler 1996). Currently, there are five known wild, extant populations of least chub. Three populations are in the Snake Valley in Utah’s West Desert and two are located on the eastern border of the native range near the Wasatch Range in the Sevier River drainage (Mills Valley and Clear Lake). An extirpated site exists at the Mona Springs in the Utah Lake drainage (USFWS 2012b). Since the initial Least Chub Conservation Agreement Strategy in 1998, the UDWR has had an ongoing monitoring program for least chub populations in Utah. The least chub is a schooling species that prefers areas of dense vegetation in slow-moving waters (UDWR 2012b). Spawning occurs in the spring or summer. Occupied habitat is located approximately 1.5 from a 2-mile transmission line corridor in Region II (Utah).

Pallid Sturgeon (Federally Endangered)

Pallid sturgeon was listed as endangered in 1990 (55 FR 36641) and a recovery plan was published in 1993 (USFWS 1993). This species is included in the analysis due to the consideration of water depletions in the Platte River drainage in Wyoming. Project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would not cross habitat for this species. This species occurs in the Lower Platte River defined as downstream of the mouth of the Elkhorn River. No critical habitat has been designated for this species. Pallid sturgeon is a bottom-dweller that prefers areas with strong current and firm sandy bottoms in the main channel of large turbid rivers (National Research Council 2004).

Razorback Sucker (Federally Endangered)

The razorback sucker was first proposed for listing as a threatened species under the ESA in 1978 (43 FR 17375). In 1980, the USFWS withdrew the proposal because it was not finalized within the 2-year time limit from the initial publication in the Federal Register (45 FR 35410). In 1989, the USFWS received a petition requesting that the razorback sucker be added to the list of endangered species. A positive finding was made and subsequently published by the USFWS in 1991 (56 FR 54957). In 1994, the USFWS designated 15 reaches of the Colorado River system, including portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan rivers in the Upper Basin and portions of the Colorado, Gila, Salt, and Verde rivers in the Lower Basin, totaling 1,724 miles as critical habitat for the species (59 FR 13374). The current recovery plan for the razorback sucker was published in 1998 and amended in 2002 (USFWS 2002d). The upper basin recovery subunit is composed of the Green River, upper Colorado River, and San Juan River subbasins and the lower basin recovery subunit includes the mainstem and tributaries of the Colorado River from Lake Mead downstream to the southerly International Boundary with Mexico. Habitat requirements for this species reflect both riverine and reservoir environments. General habitats used by adults include eddies, pools, and backwaters during the non-breeding period (July through March) (Maddux et al. 1993). Seasonal habitat use includes pools and eddies from November through April, runs and pools from July through October, runs and backwaters in May, and backwaters and flooded gravel pits during June. Juveniles prefer shallow water with minimal flow in backwaters, tributary mouths, off-channel impoundments, and lateral canals (Maddux et al. 1993). Spawning usually occurs in April through mid-June. They migrate long distances and congregate in large numbers at spawning sites.

In the Upper Colorado River Basin, razorback suckers are considered extant in four locations: Westwater and Cataract Canyons and the Utah-Colorado state line on the Colorado River, Desolation/Gray Canyons of the Green River, and a population in northeastern Colorado on the Yampa River. The razorback sucker is more widely distributed in the Lower Basin. In Lake Mead, the population is estimated at about 400 individuals with an average age of 20 to 25 years, indicating recent recruitment. Approximately 1,000 individuals are believed to inhabit a 60-mile reach between Davis Dam and Lake Havasu, which have demonstrated reproduction (USFWS 2002d). Project 250-foot-wide transmission line ROWs and transmission line corridors would cross two rivers inhabited by this species, the Yampa and Green rivers. The 250-foot-wide transmission line ROW also would cross designated critical habitat for razorback sucker in the Green River. Occupied habitat also is located downstream of 250-foot-wide transmission line ROWs and corridors in the Little Snake River in Wyoming, the Colorado River and White rivers in Colorado, and Las Vegas Wash in Nevada.

Virgin River Chub (Federally Endangered)

The Virgin River chub was officially listed as endangered in 1989, but designation of critical habitat was postponed (54 FR 35305). In 2000, 87.5 miles of the Virgin River in Utah, Arizona, and Nevada including the mainstem and 100-year floodplain was designated as critical habitat (65 FR 4140). When the species was listed, the USFWS recognized that a closely related species was found in the Moapa (Muddy) River in Nevada, but it was not affected by the listing in 1989. A recovery plan for the Virgin River chub was published in 1995 (USFWS 1995). The Virgin River chub occurs within the Muddy River in Nevada and the mainstem portion of the Virgin River from Pah Tempe Hot Springs, Utah, downstream to the confluence with Lake Mead in Nevada (USFWS 1995). The Muddy River population is not considered to be part of the

federal listing at this time. However, a proposed rule change regarding federal listing is under review by the USFWS. The present distribution of this species in the Muddy River extends from the Warm Springs area downstream to the Wells Siding (approximately 8 miles below the Meadow Valley Wash confluence). The species is usually associated with deep runs or pool habitats that have slow to moderate velocities and an abundance of cover provided by boulders, undercut banks or woody debris (USFWS 1995). Spawning is suspected to occur in April through June.

A refugium population also is located at the Dexter National Fish Hatchery and Technology Center (USFWS 1995). Project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross one stream, the Muddy River, which is inhabited by this species. As previously mentioned, the Muddy River population is not federally listed at this time.

3.10.4.2 BLM Sensitive, Forest Sensitive, and State Protected Aquatic Species

Fish

In total, 20 BLM sensitive, Forest sensitive or state-protected aquatic species potentially occur within the project analysis area (**Table 3.10-2**). This list includes 12 additional fish species. In general, most of these fish species are associated with stream habitat within the project analysis area. Some of the sensitive fish species such as Meadow Valley Wash desert sucker, Meadow Valley Wash speckled dace, Moapa speckled dace, and Moapa White River springfish are associated with stream or spring habitats. Occurrence and habitat information is summarized below for two fish species (Bonneville cutthroat trout and Colorado River cutthroat), which are BLM, Forest, and Utah sensitive species with conservation agreements. Descriptions of occurrence and habitat used by the other sensitive fish species are provided in **Appendix G**, **Table G-3**.

Bonneville Cutthroat Trout

The Bonneville cutthroat trout, a BLM and Forest sensitive species and Utah conservation agreement species, was petitioned for listing under the ESA, but the 12-month finding determined that the species was not warranted for listing. A conservation agreement was published in 2000 to assist in the management of this species in Utah (Lentsch et al. 2000). This cutthroat subspecies prefers small headwater streams with pool and riffle habitat and slow, deep water with vegetated streambanks (Sigler and Sigler 1996). Spawning usually occurs in May through June (Lentsch et al. 2000). Project 250-foot-wide transmission line ROWs and transmission line corridors would cross Bonneville cutthroat trout habitat in Utah counties including Duchesne, Sanpete, and Utah. These streams are part of the Bonneville Basin group.

Colorado River Cutthroat Trout

The Colorado River cutthroat trout is a BLM and Forest sensitive species and is considered a species of special concern in Wyoming and Colorado and a Tier 1 species in Utah (species with a conservation agreement). A conservation agreement was updated in 2006 to assure the long-term viability of this cutthroat subspecies throughout its historic range (CRCT Conservation Team 2006).This cutthroat subspecies typically is associated with isolated headwater streams with cool temperatures and clear conditions (Behnke 1981). Spawning typically occurs in April through early July depending on the water temperature. Colorado River cutthroat historically occupied portions of the Colorado River drainage in Wyoming, Colorado, Utah, Arizona, and New Mexico and probably included portions of larger streams such as the Green, Yampa, White, Colorado, and San Juan rivers (CRCT Conservation Team 2006). A recent assessment of Colorado River cutthroat trout distribution identified a total of 3,022 miles of occupied stream habitat, which represents approximately 14 percent of its historic range. Project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross Colorado River cutthroat trout habitat in Sweetwater County, Wyoming; Moffat County in Colorado; and Daggett, Uintah, Emery, Grand, Duchesne, and Wasatch counties in Utah.

Amphibians

Five additional special status amphibian species potentially occur within the project study area: Arizona toad, boreal toad, Columbia spotted frog, Great Basin spadefoot toad, and northern leopard frog. Descriptions of occurrence and habitat used by these amphibian species are provided in **Appendix G**, **Table G-3**. Additional information is provided below for the boreal toad, Columbia spotted frog, and northern leopard frog, which have conservation agreements.

Boreal Toad

The boreal toad is a subspecies of the western toad. The Southern Rocky Mountain population of boreal toad in Colorado, Wyoming, and New Mexico has been proposed for listing as endangered under the ESA. However, the subspecies was precluded from listing because the population is not recognized as a species. In Utah, it is considered a state sensitive species and it is a conservation agreement species (Hogrefe et al. 2005). In general, boreal toads are more independent of water compared to other amphibian species, although they must re-hydrate daily. Habitat used during the nonbreeding period (August through March) consists of forested areas and upland vegetation such as sagebrush and grassland. Boreal toads migrate from terrestrial habitats to aquatic habitats during the breeding period (April through July). Breeding habitats in Utah consist of low velocity, low gradient streams, off-channel marshes, beaver ponds, small lakes, reservoirs, stock ponds, wet meadows, seeps, and associated woodlands (Hogrefe et al. 2005). Burrows are used by boreal toads and other amphibians during the summer and winter to maintain stable body temperatures and prevent water loss. The alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross habitat in Juab (Birch Creek area), Wasatch (Willow Creek), and Duchesne (Sowers Creek) counties, Utah.

Columbia Spotted Frog

This species was placed on a candidate list in 1993. After the Candidate Notice of Review was completed in 1999, the West Desert population was taken off the candidate list (USFWS 1999). A conservation agreement was published in 2005 for Utah (Bailey et al. 2005). This species occurs in streams, wet meadows, springs, and springbrooks, marshes, lakes, and reservoirs (Orabona et al. 2009). It is highly aquatic, since it is rarely found far from permanent waterbodies. It may traverse upland areas during wet periods or movement to wintering sites. Stream and pond habitat is located within project transmission line corridors in Juab, Sanpete, and Wasatch counties in Utah.

Northern Leopard Frog

This species was petitioned for listing under the ESA. A 90-day finding was issued and a 12-month status review was conducted to determine if listing the species in the western part of its range is warranted (USFWS 2009). The status review and 12-month finding concluded that listing the western population or the entire species is not warranted at this time (USFWS 2011). The distribution of northern leopard frog includes portions of Wyoming, Colorado, Utah, and Wyoming (Orabona et al. 2009; Smith and Keinath 2007). Habitat consists of marshes, beaver ponds, streams, rivers, lakes, and wet meadows at elevations up to approximately 9,000 feet above mean sea level (amsl) (Smith and Keinath 2007). Northern leopard frog uses underwater areas as overwinter habitat. Project 250-foot-wide transmission line ROWs and transmission line corridors would cross habitat for northern leopard frog in Red Wash and Antelope and Muddy creeks and the Little Snake River in Wyoming; Douglas Creek and the Yampa and White rivers in Colorado; and Soldier and Currant creeks in Utah. Northern leopard frog also occurs in wetlands and springs in the Pahranagat National Wildlife Refuge in Region III.

Invertebrates

Three special status invertebrate species, Moapa Warm Spring riffle beetle, California floater, and southern Bonneville pyrg (springsnail) potentially occur within the project analysis area. Descriptions of occurrence and habitat used by these invertebrate species are provided in **Appendix G**, **Table G-3**, and summarized below.

- California Floater – This mollusk species occurs in stream (Currant Creek) and spring (Mona) habitats in Juab County, Utah within the Region II portion of the analysis area. This species has been collected at depths ranging from approximately 0.5 to 1.5 feet over mud, sand, or gravel bottoms (Oliver and Bosworth 1999). The abundance is not reported at most Utah locations.
- Moapa Warm Spring Riffle Beetle – This beetle species occurs in the Muddy River drainage in Nevada just north of a portion of the Region IV analysis area. Habitat consists of outflow streams immediately downstream of spring sources in relatively swift, shallow water.
- Southern Bonneville Pyrg – This springsnail species in a spring near Thistle Creek in Utah County, Utah, which is within the Region II analysis area. Habitat consists of small mineralized springs at elevations between approximately 5,830 and 6,740 feet amsl (Oliver and Bosworth 1999).

3.10.5 Regional Summary of Special Status Aquatic Species

A summary of the number of special status aquatic species by Project regions is provided in **Table 3.10-3**. Region II contained the highest number of species (19) followed by 12 species in Regions I and III. One species occurs within the Region IV analysis area.

Table 3.10-3 Summary of Special Status Aquatic Groups by Region

Species	Total within the Analysis Area (All Regions)	Region I	Region II	Region III	Region IV
Amphibians	5	2	4	2	0
Fish[1]	20	10	13	9	1
Aquatic Invertebrates	3	0	2	1	0
Total	**28**	**12**	**19**	**12**	**1**

[1] Number includes pallid sturgeon. This species has no potential for occurrence in the analysis area, but it is analyzed to determine if water use could affect habitat in the North Platte sub-basin.

3.10.5.1 Region I

Region I extends from the Terminal Siting Area southeast of Rawlins, Wyoming, southwest through northeastern Utah and northwestern Colorado. Habitat for aquatic species in Region I includes waterbodies in the North Platte, Great Divide, Upper Green, and White-Divide basins. Watersheds in these basins are listed in the Regional Summary of Water Resources, **Table 3.4-2**. Special status aquatic species that occur in Region I are listed in **Table 3.10-4**.

Table 3.10-4 Special Status Species Potentially Occurring in Region I

Amphibians		
Great Basin spadefoot toad	Northern leopard frog	
Fish		
Bluehead sucker	Bonytail[2]	Colorado pikeminnow
Colorado River cutthroat trout	Flannelmouth sucker	Humpback chub[2]
Mountain sucker	Razorback sucker	Roundtail chub
Pallid sturgeon[1]		
Aquatic Invertebrates - None		

[1] Pallid sturgeon has no potential for occurrence in the study area, but it is analyzed to determine if water use could affect habitat in the North Platte sub-basin.

[2] Bonytail and humpback chub do not occur within the project analysis area, but they are included in the analysis to determine if water use could affect their habitat in the Colorado River basin.

3.10.5.2 Region II

Region II extends from northeastern Utah and northwestern Colorado to the IPP in western Utah. Habitat for aquatic species in Region II includes waterbodies in the White-Yampa, Colorado Headwaters, Lower Green, Jordan, Upper Colorado – Dirty Devil, Devil, and the Escalante Desert-Sevier Lake basins. Watersheds in these basins are listed in the Regional Summary of Water Resources, **Table 3.4-2**. Special status aquatic species that occur in Region II are presented in **Table 3.10-5**.

Table 3.10-5 Special Status Species Potentially Occurring in Region II

Amphibians		
Boreal toad	Columbia spotted frog	Great Basin spadefoot toad
Northern leopard frog		
Fish		
Bluehead sucker	Bonneville cutthroat trout	Bonytail[1]
Colorado pikeminnow	Colorado River cutthroat trout	Flannelmouth sucker
Humpback chub[1]	June sucker[2]	Least chub
Mountain sucker	Razorback sucker	Roundtail chub
Southern leatherside chub		
Aquatic Invertebrates		
California floater	Southern Bonneville pyrg	

[1] Bonytail and humpback chub do not occur within the project study area, but they are included in the analysis to determine if water use could affect their habitat in the Colorado River basin.

[2] June sucker does not occur within the project study area, but it is included in the analysis to determine if water use could affect habitat in the Utah Lake and Provo River areas.

3.10.5.3 Region III

Region III extends from the IPP in western Utah to north Las Vegas, Nevada. Habitat for aquatic species in Region III includes waterbodies in the Escalante Desert-Sevier Lake and Lower Colorado-Lake Mead basins. Watersheds in these basins are listed in the Regional Summary of Water Resources, **Table 3.4-2**. Special status aquatic species that occur in Region III are presented in **Table 3.10-6**.

Table 3.10-6 Special Status Species Potentially Occurring in Region III

Amphibians		
Arizona toad	Northern leopard frog[1]	
Fish		
Bluehead sucker	Meadow Valley Wash desert sucker	Meadow Valley Wash speckled dace
Moapa speckled dace	Moapa White river springfish	Razorback sucker
Roundtail chub	Virgin River chub	Virgin River spinedace
Aquatic Invertebrates		
Moapa Warm Spring riffle beetle		

[1] Northern leopard frog is included in the analysis since it occurs in a spring located approximately 600 feet west of the 2-mile transmission line corridor.

3.10.5.4 Region IV

Region IV extends from north Las Vegas, Nevada to Marketplace. Habitat for aquatic species in Region IV is located in the Lower Colorado-Lake Mead Basin and Las Vegas Wash Watershed. Special status species that may occur in Region IV are presented in **Table 3.10-7**.

Table 3.10-7 Special Status Species Potentially Occurring in Region IV

Amphibians - None
Fish
Razorback sucker
Aquatic Invertebrates - None

3.10.6 Impacts to Special Status Aquatic Species

Potential impacts to special status aquatic species were identified based on feedback from federal and state agency biologists, public scoping, and literature related to surface disturbance effects on aquatic habitat and species. Potential effects from surface disturbance activities would include direct alteration of habitat or loss of individuals from equipment and vehicles. Habitat also could be affected by changes in water quality from increased sedimentation and potential fuel spills. The use of surface water for dust control and concrete foundations also was evaluated in terms of effects on aquatic habitat.

The methodology for evaluating impacts on special status aquatic species involved comparisons of project activities within the analysis area to habitat that supports aquatic species. The impact analysis area for special status aquatic species included perennial streams, reservoirs, lakes, ponds, and springs that would be crossed by the alternative 250-foot-wide transmission line ROWs and contain sensitive species. A downstream reach of approximately 2 miles also was considered part of the analysis area for direct disturbance. The study area for water use and potential surface water depletions extended at least 10 miles downstream of diversion points. The analysis area for roads focused on perennial streams and waterbodies with special status aquatic species that would be crossed by the 2-mile transmission line corridor. The larger study area for access roads was required because their locations have not been defined at this time. A road density analysis also was used to assess road effects on species. GIS analyses were conducted to identify perennial waterbodies and special status aquatic species occurrence within the proposed disturbance areas (i.e., ROWs and 2-mile transmission line corridors, terminals, and electrode bed areas).

Special status aquatic species included 5 amphibians, 20 fish, and 3 invertebrate species (**Table 3.10-2**). In total, seven federally listed fish species and one candidate were evaluated. The analysis also included 22 BLM sensitive species, 5 Forest sensitive species, and 16 species with state protection.

Impact parameters were used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among the applicant-proposed routes, alternatives, and alternative variations. Impact issues and the analysis considerations for special status aquatic species are listed in **Table 3.10-8**.

Table 3.10-8 Relevant Analysis Considerations for Special Status Aquatic Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Potential loss and effects from construction activities and roads on special status aquatic species or habitat from construction equipment and access roads.	The analysis includes direct disturbance effects and potential water quality changes from sediment delivery and fuel spills.
Potential effects of construction water use on aquatic habitat and species.	The analysis uses the results of the water resources analysis, which determined if water sources are linked to surface flows of streams that would be crossed by the project 250-foot-wide transmission line ROWs. Flow changes could detrimentally affect habitat for aquatic species.
Potential for increased fishing pressure on streams from construction crews and the public from the construction area and access roads.	This analysis for game fish species, some of which are special status species, is included in Section 3.9.6.

Table 3.10-8 Relevant Analysis Considerations for Special Status Aquatic Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Potential mortalities to special status amphibians during movement periods from vehicle traffic.	The analysis evaluates vehicle traffic within the ROW and access roads on amphibians.

Impact parameters included the following:

- Number of perennial streams with special status aquatic species that would be crossed by alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors.
- Number of perennial streams with federally-listed species that would be crossed by alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors.
- Acres of critical habitat for federally listed species that would be crossed by alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors.
- Potential loss of habitat (ft^2 and acres) due to construction of culverts or low-water crossings.
- Acres of road disturbance on riparian habitat for special status aquatic species.
- Road density effects (linear miles/$mile^2$) on special status species.

Potential direct and indirect effects of construction, operation, and decommissioning on special status aquatic species and their associated habitats are discussed below. After impacts are identified, relevant agency BMPs and design features are discussed in terms of reducing impacts. If impacts of concern remain after application of BMPs and design features, additional mitigation is recommended to reduce impacts to levels acceptable to the BLM and cooperating agencies.

The impacts analysis for special status species assumes that the BLM and USFS will continue to manage special status species habitats in coordination with CPW, NDOW, UDWR, and WGFD. It also assumes that the USFWS will continue to have jurisdiction over the management of federally endangered, threatened, proposed, and candidate species populations, the BLM will continue to manage BLM sensitive species in accordance with BLM Manual 6840, and the USFS will continue to manage Forest sensitive species in accordance with U.S. Forest Service Manual 2670. Further assumptions are that the design features committed to by TWE and the BMPs (**Appendix C**) would be implemented under all alternatives.

3.10.6.1 Impacts from Terminal Construction, Operation, and Decommissioning

The northern and southern terminals would be constructed regardless of which alternative route or design option is approved.

Northern Terminal

Construction of the Northern Terminal would not result in direct disturbance effects, since waterbodies (i.e., Eightmile Lake and Separation Creek) located within the proposed general siting area do not contain special status aquatic species. In addition, road access would not adversely affect special status aquatic species because existing or new roads would not cross waterbodies inhabited by any species. In summary, surface disturbance and use of access roads would not adversely affect special status aquatic species, since habitat is not located within the proposed disturbance area for the Northern Terminal.

Water use for substation/converter station construction would require approximately 1.8 acre-feet for dust control. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners or irrigation companies holding existing water rights. The effect determination of new and existing water depletions in Wyoming would be made by the Wyoming State Engineer.

Consultation with the USFWS would be completed to determine if construction water use could affect surface flows for species using the Platte River system such as pallid sturgeon.

Southern Terminal

Construction of the Southern Terminal would disturb upland areas in the Eldorado Valley watershed near Boulder, Nevada. Waterbodies located adjacent to the area include playa lakes. No perennial waterbodies are located in this area. No special status aquatic species habitat is located within the playa lakes. Surface disturbance and use of access roads would not adversely affect special status aquatic species, since habitat is not located within the proposed disturbance area for the Southern Terminal.

Water required for the construction of the Southern Terminal is estimated to be 1.2 acre-feet. The source of the water would be existing rights. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed. Consultation with the USFWS would be completed to determine if construction water use could affect federally listed fish species (razorback sucker) in the Lower Colorado River Basin.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

The impacts of constructing and operating Design Option 2 would be similar to those discussed under the alternative routes because the implementation of this design would utilize the same alternative routes and construction techniques. Differences between this design option and the Proposed Project include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between the IPP and Marketplace. The southern converter station would be located near the IPP in Utah instead of at the Marketplace in Nevada and the ground electrode system would be within 50 miles of the IPP. Construction and operation of a converter station near IPP, ground electrode system, and a series compensation station would not be expected to impact special status aquatic resources.

Design Option 3 – Phased Build Out

Impacts from construction and operation of Design Option 3 would be the same as discussed for the Applicant Proposed Alternative, since the same alternative routes, facilities, and construction would be used.

3.10.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

The types of direct and indirect effects of construction activities are generally the same as those discussed for aquatic biological resources in Section 3.9.6.2. Direct disturbance to aquatic habitat due to vehicle crossings and culvert installation for some of the access roads could detrimentally affect habitat in streams that contain special status aquatic species. Removal of riparian vegetation also would alter habitat and indirectly affect ecological functions provided by this type of vegetation. Vehicle traffic near waterbodies also could result in sedimentation and fuel spill risks. BMPs such as ECO-3 (minimize stream crossings by roads) and WAT-11 (avoid alteration of existing drainages) would be implemented to reduce these types of impacts. Design features (TWE-8 and TWE-12) also would minimize disturbance to stream channels and riparian vegetation. Other BMPs such as ECO-1, ECO-2, and ECO-4 require that project activities should avoid or minimize effects on sensitive species and their habitat. Design features TWE-2 (ESA Compliance), TWE-29 (Biological Protection Plan), TWE-31 (Development of Mitigation Measures), TWE-32 (Seasonal Restrictions), TWE-33 (Worker Training), and TWE-34 (Identification of New Locations for Protected Species) would provide additional protection for special status species. Species impacts by region and alternative are provided separately in Sections 3.10.6.3 through 3.10.6.6.

The estimated quantities of water needed per mile for construction would include approximately 3,400 gallons for foundation concrete and 240,000 gallons for dust control, totaling approximately 243,000

gallons or 0.75 acre-feet per mile. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An effect determination of new and existing water depletions would be completed after identifying the water sources for construction and whether there is any connection between these water sources and surface flows in the Colorado Basin, Utah Lake/Provo River drainage, and the Platte sub-basin. Additional discussion for water use effects on federally listed species is provided in each of the Region impact sections.

The following mitigation measure is recommended to protect habitat for conservation agreement trout species, Colorado River cutthroat trout, and Bonneville cutthroat trout. Potential water depletion effects on federally listed fish species in the Upper Colorado River Basin are mitigated by the Recovery Implementation Program for Endangered Fish in the Upper Colorado River (Recovery Plan), as discussed in Section 3.10.6.3, Region I, and Section 3.10.6.4, Region II.

SSS-1 *(Water Use): No new surface water or groundwater withdrawals that are hydrologically connected to streams containing Colorado River cutthroat trout and Bonneville cutthroat trout would be allowed. Any water necessary for construction, operation, or maintenance (including dust abatement) would not be acquired from existing water sources.*

Operation Impacts

The direct and indirect effects of operation of the Project would involve use of access roads and the ROW for repair and maintenance activities and vegetation management. Impacts associated with operation activities would involve several of the same types of effects discussed for construction activities. These impacts would include potential direct disturbance to aquatic habitat for special status aquatic species due to vehicle crossings of small to mid-size streams without access roads and removal of vegetation as part of maintenance activities. Indirect effects on water quality would adversely affect habitat for special status aquatic species from soil disturbance within or near waterbodies by vehicles or equipment. Potential fuel spills could affect species and habitat if fuel entered waterbodies. The same BMPs and design features described under Construction Impacts, would be applied to minimize these types of impacts on special status aquatic species resulting from operations. Herbicides may be used to control vegetation as part of maintenance activities in the ROW. VEG-3 requires that herbicide use should be limited to non-persistent, immobile formulations to avoid effects on aquatic habitats and species. In addition, design features involving erosion control and use of a spill containment and control plan would be implemented. In addition to the BMPs, the following mitigation measure is recommended to avoid potential herbicide effects on biological resources.

AB-4 *(Herbicide Use Plan) – As part of vegetation management, the applicant would prepare an Herbicide Use Plan. The Plan would identify a list of approved herbicides that may be used as well as locations of areas that may be treated. Licensed herbicide applicators would be used in the treatment process. The Plan also would discuss compliance with applicable federal, state, and local agencies.*

Effectiveness: This measure would be highly effective in avoiding toxic effects of herbicide use on special status aquatic species.

Decommissioning Impacts

Removal of project structures during decommissioning would result in the same types of impacts as those discussed for construction activities. Direct disturbance to special status aquatic species habitats would occur as a result of vehicle traffic across streams. The Applicant would be responsible for reclamation of access roads following abandonment in accordance with landowner's or land agency's direction. Water quality changes involving increased sediment and fuel spill risks would occur as a result of vehicle traffic within or near waterbodies. The same BMPs and design features that are described above for construction impacts would be applied to reduce impacts during decommissioning activities. Removal of riparian vegetation would not be required as part of decommissioning.

Impact discussions and conclusions for special status aquatic species are provided for the four Project regions. This organization was used because species occurrence varies by region and few species are present in all regions.

3.10.6.3 Region I

Table 3.10-9 provides a comparison of impact parameters with the alternative routes in Region I. Based on species occurrence information and habitat associations, special status aquatic species that may be impacted by the Region I alternatives include 2 amphibians and 10 fish species (**Table 3.10-4**). Species occurrence in Region I streams is provided in **Appendix G**, **Table G-4**. Project Segment ID numbers referenced in this section are listed in **Table G-4** and depicted in **Figure 2-21**. Parameter information in **Table 3.10-9** is discussed separately for each of the Region I alternatives.

Table 3.10-9 Summary of Region I Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	2	2	7	2
Number of streams with special status aquatic species that would be crossed by 2-mile transmission line corridors or located within 2 miles downstream of corridor boundaries	3	4	10	2
Number of streams with federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	2	2	1	2
Acres of critical habitat for federally listed Colorado pikeminnow that would be crossed by 250-foot-wide transmission line ROWs	1	1	3	1
Potential Aquatic Habitat Alteration or Loss[1] (ft^2) (acres shown in parentheses)				
Colorado River cutthroat trout	0	0	800 (0.02)	0
Bluehead sucker	0	0	1,600 (0.04)	0
Flannelmouth sucker	0	0	2,400 (0.06)	0
Mountain sucker	0	0	3,000 (0.05)	0
Roundtail chub	0	0	1,600 (0.04)	0

[1] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Little Snake and Yampa.

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-10** and **3.10-11**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-10 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region I Corridor

	Alternatives							
	I-A		I-B		I-C		I-D	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams								
Construction	2	5	2	4	17	51	3	10
Operation	1	2	<1	1	5	13	1	2

Table 3.10-11 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region I Corridor

Watershed	I-A Current Density 100 feet	I-A Current Density 300 feet	I-A Density Increase 100 feet	I-A Density Increase 300 feet	I-A Streams with Special Status Species (# of Segments)	Watershed	I-B Current Density 100 feet	I-B Current Density 300 feet	I-B Density Increase 100 feet	I-B Density Increase 300 feet	I-B Streams with Special Status Species (# of Segments)
Greasewood Gulch-Little Snake River	0.38	0.66	0.05	0.04	Little Snake River (1)	Greasewood Gulch-Little Snake River	0.38	0.66	0.04	0.03	Little Snake River (1)
Spring Creek-Yampa River	0.47	1.01	0.03	0.03	Yampa River (1)	Spring Creek-Yampa River	0.47	1.01	0.03	0.04	Yampa River (1)

Watershed	I-C Current Density 100 feet	I-C Current Density 300 feet	I-C Density Increase 100 feet	I-C Density Increase 300 feet	I-C Streams with Special Status Species (# of Segments)	Watershed	I-D Current Density 100 feet	I-D Current Density 300 feet	I-D Density Increase 100 feet	I-D Density Increase 300 feet	I-D Streams with Special Status Species (# of Segments)
Deception Creek-Yampa River	0.65	1.56	0.09	0.09	Yampa River (2)	Greasewood Gulch-Little Snake River	0.38	0.66	0.04	0.03	Little Snake River (1)
Elkhead Creek	0.83	1.41	0.01	0.01	Elkhead Creek (2)	Spring Creek-Yampa River	0.47	1.01	0.03	0.04	Yampa River (1)
Fortification Creek	1.19	2.02	0.13	0.13	Fortification Creek (1)						
Fourmile Creek	0.59	1.04	0.09	0.40	Fourmile Creek (1)						
Little Snake River-Willow Creek	0.54	1.13	0.06	0.04	Willow Creek (2)						
Lower Muddy Creek	1.08	2.13	0.07	0.05	Muddy Creek (3)						
Upper Muddy Creek	1.02	1.92	0.06	0.05	Muddy Creek (1)						

- Riparian Disturbance – A comparison of the construction and operation effects to riparian vegetation near streams containing special status aquatic species indicates that Alternative I-C would have greatest potential disturbance. By following stipulations for BLM FOs involving no disturbance or a buffer protection of 300 to 500 feet, the disturbance to riparian vegetation would be avoided on BLM lands.
- Road Density – The number of watersheds that would be crossed by the Region I alternative 250-foot-wide transmission line ROWs would range from 2 (I-A, I-B, and I-D) to 7 (I-C). The road density units are highest for Alternative I-C. The increase in new road density would range from <0.1 to 0.4 miles/mile^2, with the highest increase in the Fourmile Creek watershed (Alternative I-C). BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

Alternative I-A (Applicant Proposed)

Two streams (Little Snake and Yampa rivers) that contain special status aquatic species are located within the transmission line corridor. Both of these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative I-A.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

The 250-foot-wide transmission line ROW for Alternative I-A would cross occupied and critical habitat for Colorado pikeminnow in the Yampa River. Critical habitat for Colorado pikeminnow consists of the 100-year floodplain in the Yampa River. The 250-foot-wide transmission line ROW also would cross one other stream that contains Colorado pikeminnow: Little Snake River (noncritical habitat). The pikeminnow occurrence in the Little Snake River is located in the lower 1-mile section near the confluence with the Yampa River. In total, 0.9 acre of Colorado pikeminnow critical habitat would be crossed. Occupied and critical habitat for razorback sucker is located approximately 7 miles downstream of the Alternative I-A 250-foot-wide transmission line ROW crossing at a point where the Yampa River enters the Green River. Potential effects on Colorado pikeminnow could include surface disturbance to critical habitat located within the 100-year floodplain. Indirect effects on both species could include sedimentation, riparian removal, and potential fuel spill risks. These effects could occur within the 250-foot-wide transmission line ROW and use of new or upgraded access roads. BMPs such as ECO-1 and ECO-4 require the consideration of sensitive or unique habitats and the avoidance, minimization, or mitigation for impacts to sensitive species and their habitat through project design. Two BMPs require that no instream disturbance should occur between July 1 and September 30 to avoid impacts to the four federally endangered fish species in the Upper Colorado River Basin (WWEC) and construction activities should avoid modification of critical habitat for any species (BLM Vernal RMP). Design features such as TWE-2 (ESA Compliance), TWE-29 (Biological Protection Plan), and TWE-31 (Development of Section 7 Mitigation Measures) would be used to reduce impacts to important, sensitive, or unique habitats and develop appropriate mitigation measures. The following mitigation measure is recommended to further protect critical habitat for Colorado pikeminnow.

SSS-2 *(No Permanent Structures or New Roads in Critical Habitat for Federally Listed Fish Species): No permanent structures or new roads would be constructed in critical habitat for federally endangered fish species. Any temporary disturbance to soils in the 100-year floodplain within critical habitat would be minimized to the extent possible and restoration would be completed to maintain existing conditions.*

Effectiveness: This measure would be highly effective in avoiding direct disturbance to critical habitat for Colorado pikeminnow.

Alternative I-A would cross 1 acre of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat

for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

As part of flow requirements for the four endangered fish species in the Upper Colorado River Basin (Colorado pikeminnow, humpback chub, bonytail, and razorback sucker), water use for projects must comply with the *Recovery Implementation Program for Endangered Fish Species in the Upper Colorado Basin* (Recovery Plan) (USFWS 2013). To ensure the survival and recovery of the four endangered fish species in the Upper Colorado River, water users with depletions are required to make a one-time payment to the Recovery Plan. In 1995, an intra-USFWS Opinion determined that the fee for depletions of less than 100 acre-feet (annual average) would no longer be required. Water use for this project (i.e., approximately 2 acre-feet for foundation concrete and 114 acre-feet for dust control) would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 106 acre-feet of the water use would be within the Colorado River Basin. In Wyoming, the effect determination for new and existing depletions would be completed by the Wyoming State Engineer. The evaluation would determine if specific construction water sources have any contributions to surfaces flows in the Upper Colorado Basin. If water sources are not connected to surface flows, no fee payment would be required.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

The pallid sturgeon is located in the lower Platte River downstream of the Elk River confluence in Nebraska. This area is located a considerable distance downstream of any construction or operation disturbance areas in Wyoming, and so these activities would not affect pallid sturgeon. Water depletion also must be evaluated for pallid sturgeon. The Platte River Recovery Implementation Program (PRRIP) was implemented in 2006 to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska. As mentioned above for the Colorado River Basin species, the effect determination for new and existing depletions would be completed by the Wyoming State Engineer. Approximately 0.9 acre-feet of the construction use would occur within the Platte River Basin. The evaluation would determine if specific construction water sources have any contributions to surface flows in the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. This evaluation would be used to determine if a mitigation payment to the PRRIP would be required.

The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

One stream, the Little Snake River at Project Segment 180.2, contains potential habitat for northern leopard frog and would be crossed by Alternative I-A. The potential effects of construction activities on northern leopard frog would include potential direct disturbance to habitat (i.e., flooded areas, wetlands, streams, or ponds) from vehicle traffic and riparian vegetation. Vehicle traffic also could cause mortalities as frogs move to or from aquatic habitats during breeding periods in the spring and summer months. Indirect effects on frog habitat would consist of sedimentation from soil disturbance near aquatic habitats and potential fuel spills. BMPs and design features would minimize erosion effects on waterbodies and restrict refueling within 100 feet of wetlands and streams. BMPs and design features associated with WWEC would be applicable

to northern leopard frog habitat in Region I. In addition, Stipulation 310 would be applied to wetlands within the Rock Springs FO, which would require a buffer of 500 feet around wetlands, streams, springs, ponds, and lakes. This measure would minimize effects on amphibian habitat.

BMPs and design features would be implemented to minimize effects of construction activities on northern leopard frog aquatic habitat. Impacts from these activities during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-A transmission line corridor. Spadefoot toads utilize burrows in terrestrial habitats during the nonbreeding period. This toad species requires water sources for breeding such as rain pools, roadside and irrigation ditches, flooded fields, intermittent and permanent desert streams, and pond and reservoir edges (Buseck et al. 2005). Surface disturbance activities could alter their terrestrial habitat during the nonbreeding period or their aquatic habitat during the breeding period. Vehicle traffic during construction could cause mortalities during movements to and from water sources used for breeding in the spring months.

In summary, surface disturbance activities could alter terrestrial habitat used by Great Basin spadefoot toad during the nonbreeding period or aquatic habitat in the breeding period in the spring months. Potential mortalities from vehicles could occur if construction occurs in the spring near breeding water sources.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Yampa and Little Snake rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative I-A 250-foot-wide transmission line ROW. Construction activities near these rivers could result in sediment and fuel spill risks. There would be no habitat loss from construction because culverts or low water construction techniques would not be required for large rivers. The same BMPs and design features for erosion control and spill prevention discussed for game fish streams would also apply to streams containing Colorado River cutthroat trout. Due to the large size of the Yampa and Little Snake rivers, new roads would not be constructed across these streams. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat in the Yampa and Little Snake rivers during construction would be of a low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

Two streams (Little Snake and Yampa rivers) that contain bluehead sucker, flannelmouth sucker, and roundtail chub would be crossed by the Alternative I-A 250-foot-wide transmission line ROW. Vehicles and equipment would not cross large rivers such as the Yampa and Little Snake. Indirect impacts would be the same as discussed for other fish species. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in the Yampa River and Little Snake rivers during construction would be of a low magnitude.

<u>Alternative I-B</u>

In total, two streams (Little Snake and Yampa rivers) that contain special status aquatic species are located within the Alternative I-B transmission line corridor and would be crossed by its 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative I-B.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction activities could result in direct disturbance to 1 acre of Colorado pikeminnow critical habitat in the Yampa River. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow habitat near the Yampa River crossing and downstream reaches occupied by razorback sucker would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative I-B would cross 1 acre of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

Approximately 2 acre-feet for foundation concrete and 117 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 109 acre-feet of the construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

Construction water use for Alternative I-B would be approximately 9 acre-feet from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights in the Platte River Basin. After specific water sources are identified, an evaluation would be completed to determine if the water sources could result in new depletions in the North Platte watershed in Wyoming or the downstream section of the Platte River Basin in Nebraska. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

One stream, the Little Snake River at Project Segment 186, contains potential habitat for northern leopard frog and would be crossed by Alternative I-B. The potential effects of construction activities on northern leopard frog would be the same as discussed for Alternative I-A. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region I. In addition, BMP-310 would be applied to wetlands within the Rock Springs FO, which would require a buffer of 500 feet around wetlands, streams, springs, ponds, and lakes. This measure would minimize effects on amphibian occurrence and mortalities during movements to these areas. Impacts from vehicle movement during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-B corridor. Surface disturbance activities could alter Great Basin spadefoot toad terrestrial habitat during the nonbreeding period or aquatic habitat during the breeding period. Potential impacts to habitat would be considered short-term in duration and low magnitude due to low traffic volume and one-time vehicle movement. Vehicle traffic during construction could cause mortalities during movements to

and from water sources used for breeding in the spring months. Mortalities are expected to be relatively low considering the traffic volume.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Yampa and Little Snake rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative I-B 250-foot-wide transmission line ROW. There would be no habitat loss from construction because culverts or low water construction techniques would not be required. Construction and operation maintenance effects on Colorado cutthroat trout habitat would be the same as discussed for Alternative I-A.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

Two streams (Little Snake and Yampa rivers) would be crossed by the Alternative I-B 250-foot-wide transmission line ROW. There would be no habitat loss from construction because culverts or low water construction techniques would not be required. Impacts would be the same as discussed for Alternative I-A. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

Alternative I-C

In total, 10 streams are located within the Alternative I-C 2-mile transmission line corridor that contain special status aquatic species. These streams include Separation Creek, Antelope Creek, Elkhead Creek, Fortification Creek, Fourmile Creek, Little Cottonwood Creek, Little Snake River, Muddy Creek (two crossings), Willow Creek, and the Yampa River. Except for Separation, Muddy, and Willow creeks, these streams would be crossed by the Alternative I-C 250-foot-wide transmission line ROW. Species-specific impacts associated with Alternative I-C are discussed below.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction activities could result in direct disturbance to 3 acres of Colorado pikeminnow critical habitat in the Yampa River. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow habitat near the Yampa River crossing and downstream reaches occupied by Colorado pikeminnow and razorback sucker would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative I-C would cross 3 acres of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

Approximately 2 acre-feet for foundation concrete and 137 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 130 acre-feet of the construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

Construction water use for Alternative I-C would be approximately 9 acre-feet from the Platte River Basin. This water would be obtained from municipal sources, commercial sources, or a temporary water use

agreement with landowners holding existing water rights. After specific water sources are identified, an evaluation would be completed to determine if the water sources could result in new depletions in the North Platte watershed in Wyoming or the downstream section of the Platte River Basin in Nebraska.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive, and Nevada Protected)

Potential habitat for northern leopard frog would be crossed by Alternative I-C in one stream, Muddy Creek. The potential effects of construction activities on northern leopard frog would be the same as discussed for Alternative I-A. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region I. In addition, BMP-310 would be applied to wetlands within the Rock Springs FO, which would require a buffer of 500 feet around wetlands, streams, springs, ponds, and lakes. This measure would minimize effects on amphibian occurrence in and movements to these areas. Impacts from vehicle movement during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities if traffic movement coincides with frog movements during breeding periods.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-C transmission line corridor. Surface disturbance activities could alter Great Basin spadefoot toad terrestrial habitat during the nonbreeding period or aquatic habitat during the breeding period. Potential impacts to habitat would be considered short-term and low magnitude due to low traffic volume and one-time vehicle movement. Vehicle traffic during construction could cause mortalities during movements to and from water sources used for breeding in the spring months.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Four streams (Fourmile, Little Cottonwood, and Willow creeks, and the Yampa River) that contain Colorado River cutthroat trout would be crossed by the Alternative I-C 250-foot-wide transmission line ROW. Potential instream disturbance to their habitat could occur if vehicles cross smaller streams such as Fourmile and Little Cottonwood creeks using ford or culvert techniques for road access. Vehicle traffic within the ROW also could cross streams that contain these species. Direct habitat loss could be 800 ft^2 (0.02 acre), if a culvert or low water construction is required at the Fourmile and Little Cottonwood Creek crossings. The same BMPs and design features discussed for game fish streams would also apply to streams containing Colorado River cutthroat trout. Other applicable BMPs would be used to protect these species. BMP 287 (White River National Forest) restricts construction of new roads within 350 feet of occupied cutthroat trout streams and 150 feet from the edge of historic floodplain. The following mitigation measure is recommended to avoid potential effects on cutthroat trout spawning.

SSS-3 *(Avoid Spawning Habitat Disturbance for Special Status Trout Species): If spawning areas for Colorado River cutthroat trout are known to occur at streams proposed for vehicle crossing or culvert construction, instream disturbance would be scheduled to avoid the spawning period from April through May. The exact dates for avoidance would be determined through discussions with WGFD, CPW, or UDWR. All disturbed areas would be restored to pre-construction conditions prior to the next spawning season. The state agencies also would determine if a habitat survey would be required prior to any project disturbance, which would assist in defining habitat conditions for restoration.*

Effectiveness: This measure would be highly effective in avoiding spawning periods for special status trout species and restoring any disturbed habitat.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat during construction would be of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-2**.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following BLM sensitive sucker and chub species are located in streams that would be crossed by the transmission line corridor for Alternative I-C: bluehead sucker (Yampa River and Little Snake rivers and Fortification and Muddy creeks), flannelmouth sucker (Elkhead Creek, Fortification Creek, Muddy Creek, Little Snake River, and the Yampa River), and roundtail chub (Fortification Creek, Muddy Creek, and the Little Snake and Yampa rivers). The Alternative I-C 250-foot-wide transmission line ROW would cross the Little Snake River, Yampa River, Muddy Creek, Elkhead Creek, Fortification Creek, and Fourmile Creek. Direct disturbance to these species' habitats could occur in the small to mid-size streams such as Elkhead, Fortification, Fourmile, and Muddy Creek due to vehicle traffic. Habitat loss could be 1,600 to 2,400 ft^2 (0.04 to 0.06 acre) for these species, if culverts or low water construction are required in the smaller streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in six streams during construction would be of a low magnitude. If roads are constructed across small and mid-sized streams such as Elkhead, Fourmile, Fortification, and Muddy creeks, construction impacts would occur to habitat for special status sucker species and roundtail chub. Disturbed habitat would be restored to pre-construction conditions resulting in impacts of relatively low net magnitude.

Mountain Sucker (BLM Sensitive)

The Alternative I-C 250-foot-wide transmission line ROW would cross two streams (Fourmile and Muddy creeks) containing mountain sucker. Muddy Creek would be crossed three times and Fourmile Creek would be crossed once by the 250-foot-wide transmission line ROW. Habitat loss could be 1,600 ft^2 (0.04 acre), if culverts or low water construction are required for the four 250-foot-wide transmission line ROW crossings. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in two streams potentially crossed during construction would be of a low magnitude. If a culvert or road is constructed across two perennial stream crossings, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude.

<u>Alternative I-D (Agency Preferred)</u>

In total, two streams (Little Snake and Yampa rivers) that contain special status aquatic species are located within the 2-mile transmission line corridor and would be crossed by 250-foot-wide transmission line ROWs. Species-specific impacts are discussed below for Alternative I-D.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction activities could result in direct disturbance to 1 acre of Colorado pikeminnow critical habitat in the Yampa River. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads to be located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow habitat near the Yampa River crossing and downstream reaches occupied by razorback sucker would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative I-D would cross 1 acre of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

Approximately 2 acre-feet for foundation concrete and 126 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 119 acre-feet would occur within the Colorado River Basin.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

Construction water use for Alternative I-D would require approximately 9 acre-feet from the Platte River Basin. This water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. After specific water sources are identified, an evaluation would be completed to determine if the water sources could result in new depletions in the North Platte watershed in Wyoming or the downstream section of the Platte River Basin in Nebraska.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

One stream, the Little Snake River at Project Segment 186, contains potential habitat for northern leopard frog and would be crossed by Alternative I-D. The potential effects of construction activities on northern leopard frog would be the same as those discussed for Alternative I-A. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region I. These measures would minimize adverse effects on amphibian occurrence and movements in these areas. Impacts from vehicle movement during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-D transmission line corridor. Surface disturbance activities could alter Great Basin spadefoot toad terrestrial habitat during the nonbreeding period or aquatic habitat during the breeding period. Potential impacts to habitat would be considered short-term in duration and low magnitude due to low traffic volume and one-time vehicle movements. Vehicle traffic during construction could cause mortalities during movements to and from water sources used for breeding in the spring months.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Yampa and Little Snake rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative I-D 250-foot-wide transmission line ROW. There would be no habitat loss due to construction because culverts or low water construction techniques would not remove habitat. Construction and operation maintenance effects on Colorado cutthroat trout habitat would be the same as discussed for

Alternative I-A. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat in the Yampa and Little Snake rivers during construction would be of a low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive)

Two streams (Little Snake and Yampa rivers) would be crossed by the Alternative I-D 250-foot-wide transmission line ROW. There would be no habitat loss due to construction because culverts or low water construction techniques would not remove habitat. Impacts would be the same as discussed for Alternative I-A. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in the Yampa and Little Snake rivers during construction would be of a low magnitude.

The Tuttle Easement micro-siting options would not affect special status aquatic species since no aquatic habitat is located within the areas associated with these variations.

Alternative Connectors in Region I

The Mexican Flats, Fivemile Point North, and Baggs alternative connectors each would cross one stream, Muddy Creek, which contains special status sucker and chub species. Fivemile Point South Alternative Connector would not cross any perennial streams. **Table 3.10-12** summarizes the impacts and advantages/disadvantages associated with the two alternative connectors.

Table 3.10-12 Summary of Region I Alternative Connector Impacts for Special Status Aquatic Species

Alternative Connector	Analysis	Impact Conclusion
Mexican Flats and Fivemile Point North Alternative Connectors	One additional perennial stream (Muddy Creek) containing special status aquatic species is located within the transmission line corridor, and could be impacted by vehicle traffic on access roads.	The disadvantage of using these alternative connectors would be potential increased disturbance to Muddy Creek and special status species, flannelmouth sucker and roundtail chub.
Baggs Alternative Connector	One additional perennial stream (Muddy Creek) containing special status aquatic species is located within the proposed ROW and the transmission line corridor, and could be impacted by vehicle traffic.	The disadvantage of using this alternative connector would be potential increased disturbance to Muddy Creek and special status species, flannelmouth sucker and roundtail chub.

Alternative Ground Electrode Systems in Region I

The northern electrode system would be required within 100 miles of the northern terminal, which is based on the conceptual locations and connections to the alternative routes. There would be no impacts on special status aquatic species, since the conceptual locations do not support habitat for special status fish, amphibian, or invertebrate species.

Region I Conclusion

Based on a comparison of impact parameters for Region I alternatives, potential impacts to special status aquatic species would be greatest for Alternative I-C. Potential effects for Alternatives I-A (Applicant Proposed), I-B, and I-D (Agency Preferred) would be similar and relatively low compared to Alternative I-C (**Table 3.10-9**). Alternative I-C would cross the highest number of streams with special status aquatic species (10) and critical habitat for federally listed Colorado pikeminnow (3 acres). In comparison, the other three alternatives would cross 2 to 4 streams with special status aquatic species and would cross 1 acre of critical habitat for federally endangered fish. Alternative I-C also could result in the greatest alteration or loss of habitat (800 to 2,400 ft^2 or 0.02 to 0.06 acre) compared to no loss or alternation of habitat for the other

three alternatives. Less than 0.1 percent of special status species habitat would be affected by Alternative I-C and the other three alternatives. Alternative I-C could result in the highest potential construction disturbance to riparian areas (17 acres at a 100-foot buffer and 51 acres at a 300-foot buffer) compared to the other three alternatives (2 to 3 acres at a 100-foot buffer and 4 to 10 acres at a 300-foot buffer) (**Table 3.10-10**). Alternative I-D (Agency Preferred) ranks in the low range of potential riparian effects. Alternative I-C also would result in increased new road density in seven watersheds compared to two watersheds for the other alternatives (**Table 3.10-11**). Alternative I-D (Agency Preferred) could affect road densities in two watersheds. Even though the greatest level of impacts are associated with Alternative I-C, project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.3 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.4 Region II

Table 3.10-13 provides a summary of impact parameters used to describe impacts for alternative routes in Region II. Based on species occurrence information and habitat associations, special status aquatic species that may be impacted by the proposed Project in Region II include 4 amphibians, 13 fish, and 2 invertebrate species (**Table 3.10-5**). Species occurrence in Region II streams is provided in **Appendix G**, **Table G-6**. Project Segment ID numbers referenced in this section are listed in **Table G-6** and depicted in **Figure 2-22**. Parameter information in **Table 3.10-13** is discussed separately for each of the Region II alternatives.

Table 3.10-13 Summary of Region II Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	12	8	11	7	13	11
Number of streams with special status aquatic species that would be crossed by the 2-mile transmission line corridors or located within 2 miles downstream of corridor boundaries	18	12	12	7	17	18
Number of streams with federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	1	2	2	2	1	2
Acres of critical habitat for federally listed fish species that would be crossed by 250-foot-wide transmission line ROWs						
Colorado pikeminnow	2	4	4	4	2	4
Razorback sucker	2	3	3	3	2	3
Potential Aquatic Habitat Alteration or Loss[1] (ft^2) (acres shown in parentheses)						
Northern leopard frog	400 (0.01)	800 (0.02)	800 (0.02)	0	2,000 (0.05)	2,000 (0.05)
Columbia spotted frog	400 (0.01)	400 (0.01)	0	400 (0.01)	0	0
Boreal toad	800 (0.02)	0	0	0	6,000 (0.14)	0
Bonneville cutthroat trout	2,800 (0.06)	1,200 (0.03)	0	1,200 (0.03)	3,200 (0.07)	3,200 (0.07)
Colorado River cutthroat trout	400 (0.01)	400 (0.01)	0	800 (0.02)	0	1,200 (0.03)
Southern leatherside chub	1,200 (0.03)	1,200 (0.03)	2,800 (0.06)	800 (0.02)	2,800 (0.06)	1,600 (0.04)
Bluehead sucker	2,800 (0.04)	400 (0.01)	1,200 (0.03)	0	1,200 (0.03)	0

Table 3.10-13 Summary of Region II Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Flannelmouth sucker	2,800 (0.04)	0	1,600 (0.04)	0	1,200 (0.03)	0
Mountain sucker	800 (0.02)	1,200 (0.03)	1,600 (0.04)	800 (0.02)	2,000 (0.05)	2,800 (0.06)
Roundtail chub	2,000 (0.05)	0	0	0	1,200 (0.03)	0
California floater	400 (0.01)	0	0	0	0	0
Southern Bonneville pyrg	0	0	0	0	0	0

[1] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Duchesne, Green, Price, San Pitch, Sevier, Uinta, and White.

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-14** and **3.10-15**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-14 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region II Corridor

	Alternatives											
	II-A		II-B		II-C		II-D		II-E		II-F	
Streams	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Construction	22	64	25	63	15	42	15	55	30	82	28	76
Operation	8	24	7	19	5	12	5	17	11	30	11	30

- Riparian Disturbance – A comparison of the construction effects to riparian vegetation near streams containing special status aquatic species indicates similar potential disturbance (i.e., 15 to 30 acres for the 100-foot buffer distance and 42 to 82 acres for the 300-foot buffer distance). These impacts would be reduced by BLM and USFS requirements, which range from avoiding a riparian buffer area of 200 to 1,200 feet adjacent to perennial streams to total avoidance of riparian areas. In conclusion, the disturbance to riparian vegetation would be avoided on BLM and USFS lands. There could be disturbance on private lands if riparian vegetation is present.
- Road Density – The number of watersheds that would be crossed by the Region II alternative 250-foot-wide transmission line ROWs range from 8 (II-D) to 13 (II-A). The road density units are highest for Alternative II-A. The increase in road density ranged from <0.1 to 0.5 mile/mile^2, with the highest increase in the Upper San Pitch River (Alternative II-B); Soldier Creek (Alternatives II-E and II-F); Outlet Douglas Creek (Alternative II-C); and Willow Creek (Alternative II-E) watersheds. BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

The Strawberry IRA (Option 1 Section 320.101, Option 2 Segment 320.102, and Option 3 Segment 320.103) and Cedar Knoll IRA (Option 1 Segment 320.151 and Option 2 Section 320.152) micro-siting adjustments would not substantially affect the impact analysis for special status aquatic species.

Alternative II-A (Applicant Proposed)

In total, 17 streams that contain special status aquatic species are located within the 2-mile transmission line corridor. These include Bennie, Cottonwood, Currant, Dry Gulch, Hop, Lake Fork, Montes, Nebo, Red, Soldier, Thistle, Tie Fork, and Willow creeks, and the Duchesne, Green, Strawberry, Uinta, and Lake Fork

Table 3.10-15 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region II Corridor

Watershed	II-A Current Density 100 feet	II-A Current Density 300 feet	II-A Density Increase 100 feet	II-A Density Increase 300 feet	II-A Streams with Special Status Species (# of Segments)	Watershed	II-B Current Density 100 feet	II-B Current Density 300 feet	II-B Density Increase 100 feet	II-B Density Increase 300 feet	II-B Streams with Special Status Species (# of Segments)
Cottonwood Creek-Dry Gulch Creek	1.95	2.74	0.18	0.11	Cottonwood Creek (1), Montes Creek (1), Dry Gulch Creek (2)	Coal Creek-Price River	2.03	2.90	0.12	0.08	Price River (1)
Currant Creek	3.46	3.43	0.01	0.03	Currant Creek (2)	Cottonwood Creek	1.63	2.97	0.01	0.01	Lowry River (1)
Dry Gulch Creek	1.64	2.45	0.21	0.18	Dry Gulch Creek (1)	Huntington Creek	3.94	4.22	0.03	0.03	Huntington Creek (2)
Strawberry River-Duchesne River	1.57	1.95	0.10	0.08	Duchesne River (1)	Middle Sevier River	1.45	2.18	0.01	0.02	Sevier River (1)
Middle Strawberry River	8.03	5.55	0	0.08	Willow Creek (1)	Outlet Douglas Creek	1.14	3.28	0.16	0.38	Douglas Creek (1)
Pelican Lake-Green River	0.55	1.44	0.03	0.03	Green River (1)	Red Wash-White River	1.18	2.61	0.06	0.05	White River (1)
Pigeon Water Creek-Lake Fork River	0.84	1.47	0.06	0.06	Lake Fork River (1)	Salt Wash-Green River	0.13	0.64	0.04	0.04	Green River (2)
Red Creek	3.50	4.73	0.05	0.09	Red Creek (1)	Upper San Pitch River	4.29	4.57	0.54	0.45	San Pitch River (1), Dry Pole Fork (1), North Fork Pleasant Creek (1), Pleasant Creek (1)
Soldier Creek	8.48	6.99	0.27	0.19	Soldier Creek (2), Tie Fork (1), Lake Fork (1)	Upper Sevier River	0.99	1.90	0.06	0.06	Sevier River (1)
Thistle Creek	10.98	7.25	0.23	0.19	Thistle Creek (2), Nebo Creek (1)						
Uinta River	1.41	2.20	0.01	0.01	Uinta River (1)						
Upper Strawberry River	1.03	1.61	<0.01	<0.01	Strawberry River (2)						
West Creek	3.67	4.24	0.22	0.24	Hop Creek (2), Currant Creek (1), Birch Creek (1)						

Table 3.10 15 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region II Corridor

Watershed	II-C					Watershed	II-D				
	Current Density		Density Increase		Streams with Special Status Species (# of Segments)		Current Density		Density Increase		Streams with Special Status Species (# of Segments)
	100 feet	300 feet	100 feet	300 feet			100 feet	300 feet	100 feet	300 feet	
Cottonwood Creek	1.63	2.97	0.01	0.01	Cottonwood Creek (1)	Agency Draw-Willow Creek	3.30	4.19	0.07	0.06	Willow Creek (1)
Ferron Creek	1.57	2.10	0.01	0.02	Ferron Creek (1)	Beaver Creek-Price River	7.16	6.85	0.03	0.06	Price River (1)
Headwaters Muddy Creek	2.01	2.10	0.03	0.04	Muddy Creek (1)	Cottonwood Wash-White River	0.15	0.25	0.05	0.05	White River (1)
Ivie Creek	3.91	6.30	0.05	0.15	Quitchupah Creek (2)	Huntington Creek	3.94	4.22	0.01	0.01	Huntington Creek (2)
Lost Creek-Sevier River	9.67	9.84	0.06	0.08	Lost Creek (1), Sevier River (1)	Scofield Reservoir	3.90	4.66	0.03	0.16	Mud Creek (1)
Middle Sevier River	1.45	2.18	0.04	0.04	Sevier River (1)	Sheep Wash-Green River	0.09	0.33	0.06	0.06	Green River (1)
Outlet Douglas Creek	1.14	3.28	0.16	0.38	Douglas Creek (1)	Upper San Pitch River	4.29	4.57	0.08	0.18	Oak Creek (1), Cottonwood Creek (1)
Red Wash-White River	1.18	2.61	0.06	0.05	White River (1)	West Creek	3.67	4.24	0.14	0.16	Hop Creek (1)
Salina Creek	8.89	12.15	0.13	0.13	Gooseberry Creek (1), Little Creek (1)						
Salt Wash-Green River	0.13	0.64	0.04	0.04	Green River (2)						

Table 3.10 15 Open Road Density (Miles/Mile2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region II Corridor

	II-E						II-F				
	Current Density		Density Increase		Streams with Special Status Species		Current Density		Density Increase		Streams with Special Status Species
Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)	Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)
Beaver Creek-Price River	7.16	6.85	0.12	0.20	Price River (1), Kyune Creek (1)	Agency Draw-Willow Creek	3.30	4.19	0.07	0.06	Willow Creek (1)
Cottonwood Creek-Dry Gulch Creek	1.95	2.74	0.18	0.11	Cottonwood Creek (1), Montes Creek (1), Dry Gulch Creek (2)	Beaver Creek-Price River	7.16	6.85	0.03	0.03	Price River (1), Kyune Creek (1), Kyune Creek Right Fork (1)
Dry Gulch Creek	1.64	2.45	0.21	0.16	Dry Gulch Creek (1)	Cottonwood Wash-White River	0.15	0.25	0.05	0.05	White River (1)
Pelican Lake-Green River	0.55	1.44	0.03	0.03	Green River (1)	Middle Sevier River	1.45	2.18	0.01	0.02	Sevier River (1)
Pigeon Water Creek-Lake Fork River	0.84	1.47	0.11	0.16	Lake Fork River (1)	Sheep Wash-Green River	0.09	0.33	0.06	0.06	Green River (1)
Soldier Creek	8.48	6.99	0.53	0.44	Clear Creek (1), Soldier Creek (2), Tie Fork (1), Lake Fork (1)	Soldier Creek	8.48	6.99	0.53	0.44	Soldier Creek (2), Tie Fork (1), Lake Fork (1)
Strawberry River-Duchesne River	1.57	1.95	0.16	0.13	Duchesne River (1)	Thistle Creek	10.98	7.25	0.23	0.19	Bennie Creek (1), Thistle Creek (1)
Thistle Creek	10.98	7.25	0.23	0.19	Bennie Creek (1), Thistle Creek (1), Nebo Creek (1)	Upper Sevier River	0.99	1.90	0.06	0.06	Sevier River (1)
Uinta River	1.41	2.20	0.01	0.01	Uinta River (1)	West Creek	3.67	4.29	0.16	0.19	Hop Creek (2)
West Creek	3.67	4.24	0.16	0.19	Hop Creek (2)	White River	6.37	6.29	0.19	0.24	White River (2), Tabbyune Creek (1), White River Right Fork (1)
White River	6.37	6.29	0.04	0.06	White River (2), Tabbyune Creek (1)	Willow Creek	4.16	4.26	0	0	West Fork Willow Creek (1)
Willow Creek	4.16	4.26	0.43	0.45	West Fork Willow Creek (1)						

Note: Zero indicates no new roads within the buffer area.

rivers. All of these streams except Bennie, Cottonwood, Hop, Nebo, Thistle, and Willow creeks would be crossed by the Alternative II-A 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-A.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Construction activities could result in direct disturbance to 2 acres of Colorado pikeminnow and razorback sucker critical habitat in the Green River. The 250-foot-wide transmission line ROW would cross critical habitat in Project Segment 213. Critical habitat for both species is defined as the 100-year floodplain in the Green River. Vehicles and equipment would not enter the wetted area of the river channel; however, disturbance could occur in the dry area of the 100-year floodplain on both sides of the Green River. It should be clarified that this area is an overestimate of disturbance because it includes the wet portion of the floodplain. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow and razorback sucker habitat near the Green River crossing and downstream reaches occupied by all four federally endangered fish species would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative II-A would cross 2 acres of critical habitat for Colorado pikeminnow and razorback sucker. Surface disturbance activities near the Green River pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 189 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 111 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

June Sucker (Federally Endangered, BLM Sensitive, and Utah Special Concern)

June sucker habitat in Utah Lake and the Provo River is located approximately 15 miles upgradient from the Region II corridors. There would be no direct disturbance to habitat. In addition, there would be no effects of construction water use on June sucker habitat, as the proposed water sources are not connected to surface flows in the Provo River or Utah Lake. As a result, there would be no direct or indirect effects of project construction and operation on the June sucker. This conclusion also would apply to the other Region II alternatives.

Least Chub (Federal Candidate)

Least chub habitat occurs in springs and wetland areas within the Currant Creek drainage, which are located approximately 1.5 miles downgradient of the Alternative II-A 2-mile transmission line corridor and 3.5 miles from the 250-foot-wide transmission line ROW. There would be no direct disturbance on least chub habitat. In addition, there would be no indirect effects on least chub habitat from construction, since water sources for the springs and wetlands would not be disturbed or used as dust control or concrete

formation. Least chub habitat is not located near or within the 2-mile transmission line corridors for the other Region II alternatives.

Boreal Toad (Forest Sensitive Species and Colorado Endangered and Utah CAS)

Potential breeding habitat for boreal toad overlaps with the Alternative II-A 250-foot-wide transmission line ROW near Birch Creek and Willow Creek. Potential direct habitat loss could be 800 ft^2 (0.02 acre), if a culvert or low water construction is required. Vehicle traffic could cause toad mortalities, if construction coincides with migration periods to and from a water source used for breeding or terrestrial habitat during the non-breeding period. By applying a 2-mile dispersal distance around Willow and Birch creeks, potential effects could occur in approximately 17,420 acres of terrestrial habitat. BMPs and design features associated with WWEC would be applicable to boreal toad habitat in Region II.

Impacts from vehicle movement would be considered of a low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with their movements during breeding periods.

Columbia Spotted Frog (Forest Sensitive Species and Nevada and Utah Protected)

Four habitat areas (Soldier and Willow creeks in Project Segment 320.1 and Currant Creek and unnamed tributary to Currant in segment 340) that contain Columbia spotted frog would be crossed by the Alternative II-A 2-mile transmission line corridor. One of these areas (Soldier Creek) would be crossed by the 250-foot-wide transmission line ROW. Construction activities within these streams could alter habitat used for eggs and rearing of young. Potential direct habitat loss could be 400 ft^2 (0.01 acre), if a culvert or low water crossing is required at the one ROW crossing. Direct effects of construction activities and maintenance could include mortalities to frogs from vehicle traffic within the ROW or along access roads due to stream crossings or periods when frogs move to upland areas for overwintering. Vehicle traffic also could cause sedimentation in the disturbance area near these streams. BMPs and design features for Columbia spotted frog would be the same as discussed for northern leopard frog. As discussed for California floater, mitigation measures WET-2 and WET-4 would restrict disturbance in the wetland near Currant Creek. Impacts from vehicle traffic during construction would be considered of a low magnitude. Vehicle traffic could cause Columbia spotted frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Three areas (Soldier Creek, Project Segment 320.1 and 320.15, and Currant Creek, Project Segment 340) contain potential habitat for northern leopard frog and would be crossed by Alternative II-A. The potential effects of construction activities on northern leopard frog would be the same as discussed for Region I. Potential loss of habitat would be 400 ft^2 (0.01 acre), if a culvert is used at the 250-foot-wide transmission line ROW crossing. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region II. As discussed for California floater, mitigation measures WET-2 and WET-4 would restrict disturbance in the wetland near Currant Creek. Impacts from vehicle traffic would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Eight streams including Bennie, Currant (Wasatch County), Lake Fork, Nebo, Red, Soldier, Thistle, and Tie Fork creeks would be crossed by the Alternative II-A 2-mile transmission line corridor. All of these streams except Bennie and Nebo creeks would be crossed by the 250-foot-wide transmission line ROW. Direct disturbance to habitat would occur if vehicles or equipment cross any of these streams or if culverts were constructed as part of developing new access roads. Potential loss or alteration of habitat would be 2,800 ft^2 (0.06 acre), if culverts or low water crossings are required at seven 250-foot-wide transmission line ROW crossings involving small streams. Indirect effects of instream work or surface disturbance near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for

game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species. A White River National Forest management requirement restricts construction of new roads within 350 feet of occupied cutthroat trout streams and 150 feet from the edge of historic floodplains. A Uinta National Forest requirement specifies that work in Tie Fork and Willow creeks in Utah should avoid disturbance to Bonneville and Colorado River cutthroat habitat. These streams are considered to be recovery habitat for these cutthroat subspecies. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in up to eight streams would be minimized during construction and be considered of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Willow Creek and Green and Strawberry rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative II-A 2-mile transmission line corridor and 250-foot-wide transmission line ROW. Construction- and operations-related effects on Colorado River cutthroat trout could disturb habitat in the smaller stream, Willow Creek. Potential loss of habitat would be 400 ft^2 (0.01 acre), if a culvert is used on Willow Creek. No crossings would be constructed across the Green or Strawberry rivers. BMPs, design features, and mitigation measure **SSS-3** would minimize effects to Colorado River cutthroat trout.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Soldier, Hop, and Thistle creeks) containing southern leatherside chub would be crossed by the 250-foot-wide transmission line ROW and 2-mile-wide transmission line corridor. Potential direct effects on southern leatherside chub habitat could occur in these small and mid-size streams due to vehicle and equipment crossings and removal of riparian vegetation. Potential direct habitat loss could be 1,200 ft^2 (0.03 acre), if culverts or low water crossings are required at three 250-foot-wide transmission line ROW crossings. Indirect effects involving sedimentation and potential fuel spills on southern leatherside chub habitat would the same as discussed for other fish species. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub. The following mitigation measure would be implemented to avoid impacts on spawning chub.

SSS-4 *(Avoid Spawning Habitat Disturbance for Southern Leatherside Chub): If spawning areas for southern leatherside chub are known to occur at streams proposed for vehicle crossing or culvert construction, instream disturbance would be scheduled to avoid the spawning period from April through June. The exact dates for avoidance would be determined through discussions with UDWR. All disturbed areas would be restored to pre-construction conditions prior to the next spawning season.*

Effectiveness: This measure would be highly effective in avoiding spawning periods for southern leatherside chub and restoring any disturbed habitat.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following number of streams that contain these BLM sensitive sucker and chub species would be crossed by the transmission line corridor for Alternative II-A: bluehead sucker (nine streams), flannelmouth sucker (eight streams), and roundtail chub (seven streams). The Alternative II-A 250-foot-wide transmission line ROW would cross nine streams (Cottonwood Creek, Currant Creek, Dry Gulch, Montes Creek, Lake Fork River, and Green, Strawberry, Uinta and White rivers) that contain one or more of these species. Direct disturbance to their habitat could occur in the small to mid-size streams such as Currant, Dry Gulch, Lake Fork, and Montes creeks due to vehicle traffic. Habitat loss could be 2,000 to 2,800 ft^2 (0.05 to 0.06 acre) for these species, if culverts or low water construction are required in the smaller streams. The same BMPs and

design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in nine streams during construction would be of a low magnitude. If roads are constructed across Currant, Dry Gulch, Lake Fork, and Montes creeks, impacts during construction would occur to habitat for special status sucker species and roundtail chub. Disturbed habitat would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude.

Mountain Sucker (BLM Sensitive)

The Alternative II-A 250-foot-wide transmission line ROW would cross two streams (Soldier and Thistle creeks) containing mountain sucker. Habitat loss could be 800 ft^2 (0.02 acre), if culverts or low water construction are required in this small stream. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in one stream during construction would be of a low magnitude. If a culvert or road is constructed across Soldier Creek, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

Southern Bonneville Pyrg (Utah Protected)

The transmission line corridor for Alternative II-A would cross one unnamed spring near Thistle Creek that is inhabited by the springsnail, southern Bonneville pyrg. The spring is located approximately 600 feet east of the 250-foot-wide transmission line ROW or approximately 500 feet from the ROW. Direct effects of construction could include the potential disturbance to habitat or springsnail mortalities as a result of access road traffic within or near the spring. Disturbance to habitat features involving bottom substrates or aquatic vegetation used by this species would reduce the number of individuals and possibly eliminate the population in this spring. Habitat loss or alteration could occur if vehicles cross this small spring. This spring contains one of six populations known to occur in Utah. Indirect effects of construction could adversely affect water quality and habitat from sediment input or a potential fuel spill near the spring. BMPs and design features involving sediment control and restrictions on refueling within 100 feet of waterbodies would minimize potential indirect effects on this species and habitat. The following mitigation measure is recommended to avoid potential direct effects on southern Bonneville pyrg.

SSS-5 *(Avoid Direct Disturbance to Habitat for Southern Bonneville Pyrg): No vehicle or equipment disturbance from ROW work or access road construction would be allowed within 300 feet of the unnamed spring located near Thistle Creek that contains southern Bonneville pyrg.*

California Floater (BLM Sensitive)

California floater habitat would be crossed by the Alternative II-A 250-foot-wide transmission line ROW at Currant Creek in Juab County. Direct effects of construction could include the potential disturbance to habitat or mortalities as a result of access road traffic within or near the stream or adjacent wetland complex. Two vegetation mitigation measures, WET-2 and WET-4, would protect wetlands by establishing a 500-foot buffer that would restrict direct disturbance. Habitat loss could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required in Currant Creek. The following mitigation measure is proposed to protect California floater in Currant Creek.

SSS-6 *(Survey to Avoid Direct Disturbance to California Floater Habitat): If instream construction is proposed for Currant Creek, a survey would be conducted to determine if California floater is present. If the species is absent, construction would be allowed after meeting UDWR requirements for restoration. If the species is present, relocation of individuals in the disturbance area would be considered to avoid impacts to it.*

In summary, potential direct impacts to California floater would be minimized by implementing mitigation measures **SSS-6**, **WET-2**, and **WET-4**. BMPs, BLM stipulations, and design features would be followed to minimize potential sedimentation or fuel spill impacts to California floater habitat. These protection measures would assist in maintaining the population and contribute to a trend in avoiding federal listing.

USFS Sensitive Species

In total, seven perennial streams are located within the Alternative II-A transmission line corridor in one National Forest (Uinta-Wasatch-Cache) **(Appendix G**, **Table G-13**). Four of these streams (Soldier, Tie Fork, and Willow creeks and the Strawberry River) contain USFS sensitive species. Species include Bonneville cutthroat trout and southern leatherside chub in Soldier and Tie Fork creeks, and Colorado River cutthroat trout in Willow Creek and Strawberry River. Columbia spotted frog also occurs in Soldier Creek at Project Segment 320.1 and 320.15. Three of the streams would be crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 400 ft^2 (0.01 acre) in each stream, if construction of culverts or low water crossings is required. A stipulation for the Uinta-Wasatch-Cache National Forest requires that no actions affect cutthroat trout in Tie Fork and Willow creeks, Therefore, direct disturbance to habitat or other indirect effects involving sediment or fuel spills would not be allowed in these two streams. Sediment input and riparian disturbance would be avoided by following the Uinta-Wasatch-Cache National Forest stipulation that requires a 300-foot buffer along perennial streams.

Alternative II-B

In total, 11 streams (Bitter, Douglas, Dry Pole, Huntington, North Fork Pleasant, and Pleasant creeks and the Green, Lowry, Price, San Pitch, Sevier, and White rivers) that contain special status aquatic species are located within the Alternative II-B 2-mile transmission line corridor. Except for Bitter Creek, Dry Pole Creek, North Fork Pleasant Creek, and the Lowry River, these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-B.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Construction activities could result in direct disturbance to 4 acres of Colorado pikeminnow critical habitat in the Green and White rivers and 3 acres of razorback sucker critical habitat in the Green River. The 250-foot-wide transmission line ROW would cross critical habitat in Project Segment 220.1 at the two locations. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow and razorback sucker habitat near the Green River crossing and downstream reaches occupied by all four federally endangered fish species would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative II-B would cross 4 acres of critical habitat for Colorado pikeminnow and 3 acres for razorback sucker. Surface disturbance activities near the Green and White rivers pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 4 acre-feet for foundation concrete and 254 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 191 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Columbia Spotted Frog (Forest Sensitive Species and Nevada and Utah CAS)

One stream (San Pitch River in Sanpete County, Project Segment 310) containing Columbia spotted frog would be crossed by the Alternative II-B 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Direct effects of construction and maintenance activities would be the same as discussed for Alternative II-A. Potential direct loss of aquatic habitat could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required. BMPs and design features for Columbia spotted frog would be the same as discussed for northern leopard frog. Impacts from construction traffic would be considered a low magnitude. Vehicle traffic could cause Columbia spotted frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Two streams (White River and Douglas Creek) contain potential habitat for northern leopard frog and would be crossed by Alternative II-B. The potential effects of construction activities on northern leopard frog would be the same as discussed for Region I. Potential loss of habitat would be 800 ft^2, if culverts are used at the 250-foot-wide transmission line ROW crossings. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region II. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause northern leopard frog mortalities if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Three streams consisting of Dry Pole, North Fork Pleasant, and Pleasant creeks would be crossed by the Alternative II-B 2-mile transmission line corridor. Pleasant Creek is the only stream that would be crossed by the 250-foot-wide transmission line ROW. Direct disturbance to habitat would occur if vehicles or equipment cross any of these streams or if culverts were constructed as part of developing new access roads. Potential habitat loss would be 1,200 ft^2 (0.03 acre) associated with the Pleasant Creek crossings. Indirect effects of instream work or surface disturbance near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in up to six streams during construction would be a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Five streams (Bitter and Huntington creeks and the Green, Lowry, and White rivers) containing Colorado River cutthroat trout habitat would be crossed by the Alternative II-B 2-mile transmission line corridor. The Green and White rivers and Huntington Creek also would be crossed by the 250-foot-wide transmission line ROW. Potential habitat loss of 400 ft^2 (0.01 acre) would occur, if a culvert or low water construction occurred

at the Huntington Creek crossing. BMPs, design features, and mitigation measure **SSS-3** would minimize effects to Colorado River cutthroat trout.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Two streams (San Pitch and Sevier rivers) contain southern leatherside chub habitat and would be crossed by the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor. Potential effects of construction and maintenance operations on southern leatherside habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 1,200 ft^2 (0.03 acre), if culverts or low water construction is required. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub. In addition, mitigation measure **SSS-4** also would be implemented to avoid impacts on spawning.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following BLM sensitive sucker and chub species occur in streams that would be crossed by the transmission line corridor for Alternative II-B: bluehead sucker (Green River, Huntington Creek, Lowry River, Price River, and White River), flannelmouth sucker (Green, Price, and White rivers), and roundtail chub (Green and White rivers). The number of 250-foot-wide transmission line ROW crossings for these species include four for bluehead sucker, three for flannelmouth sucker, and three for roundtail chub. Direct disturbance to their habitat could occur in the small to mid-size streams such as Huntington Creek due to vehicle traffic. Habitat loss could be 0 to 400 ft^2 (0.01 acre) for these species, if culverts or low water crossings are required in the smaller streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in five streams during construction would be of a low magnitude. If roads are constructed across Huntington Creek, impacts during construction would occur in habitat for special status sucker species and roundtail chub. Disturbed habitat would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

Mountain Sucker (BLM Sensitive)

The Alternative II-B 250-foot-wide transmission line ROW would cross two streams (San Pitch and Sevier rivers) containing mountain sucker. Habitat loss could be 1,200 ft^2 (0.03 acre), if culverts or low water crossings are required in these streams. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in two streams during construction would be of a low magnitude.

USFS Sensitive Species

In total, six perennial streams, one spring, and one pond are located within the Alternative II-B transmission line corridor in one National Forest (Manti-LaSal) (**Appendix G, Table G-13**). Two streams in the Manti-LaSal National Forest contain USFS sensitive species (Bonneville cutthroat trout in Dry Pole Creek and Colorado River cutthroat trout in Lowry River). There would be no direct habitat loss in these two streams, since they would not be crossed by the 250-foot-wide transmission line ROW. Potential sediment input and riparian disturbance would be minimized by Forest management direction that avoids impacts to riparian habitat.

<u>Alternative II-C</u>

In total, 12 streams (Bitter, Cottonwood, Douglas, Ferron, Gooseberry, Little, Lost, Muddy, and Quitchupah creeks and the Green, Sevier, and White rivers.) are located within the 2-mile transmission line corridor that

contains special status aquatic species. All of these streams except Bitter Creek would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-C.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Direct and indirect effects on the federally endangered fish species in the Upper Colorado River Basin for Alternative II-C would be the same as discussed for Alternative II-B. Alternative II-C would cross 4 acres of critical habitat for Colorado pikeminnow in the Green and White rivers and 3 acres for razorback sucker in the Green River (Project Segment 220.1). Surface disturbance activities near the Green and White rivers pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 4 acre-feet for foundation concrete and 269 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 197 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Impacts of Alternative II-C on northern leopard frog would be the same as discussed for Alternative II-B. Two streams, the White River and Douglas Creek, with northern leopard frog habitat would be crossed by the Alternative II-C. Potential loss of habitat would be 800 ft^2 (0.02 acre), if a culvert is used at the 250-foot-wide transmission line ROW crossing on Douglas Creek. Impacts from construction activities would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

No streams containing Bonneville cutthroat trout habitat would be crossed by Alternative II-C. Therefore, this alternative would cause no effects on Bonneville cutthroat trout.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Bitter Creek and the Green and White rivers) that contain Colorado River cutthroat trout would be crossed by the 2-mile transmission line corridor. The Green and White rivers would be crossed by the 250-foot-wide transmission line ROW for Alternative II-C. Construction- and operations-related effects on Colorado cutthroat trout would not disturb habitat in the two larger rivers. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat during construction would be of a low magnitude.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Six streams (Gooseberry, Little, Lost, Muddy, and Quitchupah creeks and the Sevier River) contain southern leatherside chub habitat and would be crossed by the 2-mile transmission line corridor. All of these streams except Little Creek would be crossed by the Alternative II-C 250-foot-wide transmission line ROW.

Potential effects of construction and maintenance operations on southern leatherside habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 2,800 ft^2 (0.06 acre), if culverts or low water construction is required at seven 250-foot-wide transmission line ROW crossings. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub along with mitigation measure **SSS-4**.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following sucker and chub species occur in streams that would be crossed by the 2-mile transmission line corridor for Alternative II-C: bluehead sucker (Cottonwood Creek, Ferron Creek, Green River, Muddy Creek, and White River), flannelmouth sucker (Ferron Creek, Green River, Muddy Creek, Quitchupah Creek, and White River), and roundtail chub (Green and White rivers). The number of 250-foot-wide transmission line ROW crossings for these species include six for bluehead sucker, seven for flannelmouth sucker, and three for roundtail chub.. Habitat loss could be 0 to 1,600 ft^2 (0.04 acre) for these species, if culverts or low water construction are required in the smaller streams. No direct disturbance to their habitat would be expected due to the relatively large size of these streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in seven streams during construction would be of a low magnitude. Road disturbance and effects on habitat for these species would not be expected for these larger streams.

Mountain Sucker (BLM Sensitive)

The Alternative II-C 250-foot-wide transmission line ROW would cross three streams (Muddy and Quitchupah creeks and the Sevier River) containing mountain sucker. Habitat loss could be 1,600 ft^2 (0.04 acre), if culverts or low water construction are required in this small stream. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in three streams during construction would be of a low magnitude. If a culvert or road is constructed across Muddy and Quitchupah creeks, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

USFS Sensitive Species

In total, six perennial streams, one reservoir, and four springs are located within the Alternative II-C transmission line corridor in the Fishlake National Forest (**Appendix G**, **Table G-13**). One of these streams (Little Creek) contains a USFS sensitive species, the southern leatherside chub. The 250-foot-wide transmission line ROW would cross this stream, which could result in a direct loss of aquatic habitat of 400 ft^2 (0.01 acre), if culverts or low water construction is required. By following the Forest management guidance involving avoidance of riparian areas near streams, effects on riparian vegetation and sediment input would be minimized.

<u>Alternative II-D</u>

In total, seven streams (Cottonwood, Huntington, Mud, and Oak creeks and the Green, San Pitch, and White rivers) are located within the 2-mile transmission line corridor that contains special status aquatic species. All of these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-D.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Direct effects on critical habitat due to potential disturbance within the 250-foot-wide transmission line ROW crossing would be 4 acres for Colorado pikeminnow in the Green and White rivers and 3 acres for razorback sucker in the Green River. Indirect effects on the federally endangered fish species in the Upper Colorado River Basin for Alternative II-D would be the same as discussed for Alternative II-A.

In summary, Alternative II-D would cross 4 acres of critical habitat for Colorado pikeminnow and 3 acres for razorback sucker. Surface disturbance activities near the Green and White rivers pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 193 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 132 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Columbia Spotted Frog (Forest Sensitive Species and Nevada and Utah Protected)

One stream (San Pitch River in Sanpete County, Project Segment 217.15) containing Columbia spotted frog would be crossed by the Alternative II-D 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Direct effects of construction and maintenance activities would be the same as discussed for Alternative II-A. Potential direct loss of aquatic habitat could be 400 ft^2 (0.01 acre) if a culvert or low water construction is required. BMPs and design features for Columbia spotted frog would be the same as discussed for northern leopard frog. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause Columbia spotted frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

One stream with northern leopard frog habitat, the White River, would be crossed by the Alternative II-D 2-mile transmission line corridor. The potential effects of construction activities on northern leopard frog would be the same as discussed for Region I, but only one habitat area would be crossed by the Alternative II-D 250-foot-wide transmission line ROW. There would be no loss of habitat, since culverts or low water construction would not occur at the White River crossing. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Three streams consisting of Mud, Oak, and Cottonwood creeks would be crossed by the Alternative II-D 2-mile transmission line corridor and 250-foot-wide transmission line ROW. Direct disturbance to habitat would occur if vehicles or equipment cross any of these streams or if culverts were constructed as part of developing new access roads. Potential habitat loss would be 1,200 ft^2 (0.03 acre) associated with the three 250-foot-wide transmission line ROW crossings. Indirect effects of instream work or surface disturbance

near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in three streams during construction would be of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Four streams (Huntington and Willow creeks and the Green and White rivers) that contain Colorado River cutthroat trout would be crossed by the 2-mile transmission line corridor and 250-foot-wide transmission line ROW for Alternative II-D. Construction- and operations-related effects on Colorado River cutthroat trout could disturb habitat in Huntington and Willow creeks. Direct loss of habitat could be 800 ft^2 (0.02 acre), if culverts or low water construction is required at the Willow Creek crossing. BMPs, design features, and mitigation measure **SSS-3** would minimize effects to Colorado River cutthroat trout. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat in four streams during construction would be of a low magnitude.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Hop Creek and the San Pitch River) contain southern leatherside chub habitat and would be crossed by the 2-mile transmission line corridor and the 250-foot-wide transmission line ROW. Potential effects of construction and maintenance operations on southern leatherside habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 800 ft^2 (0.02 acre) if culverts or low water construction is required. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub along with mitigation measure **SSS-4**.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following number of streams that contain these sucker and chub species would be crossed by the 2-mile transmission line corridor for Alternative II-D: bluehead sucker (Green and White rivers), flannelmouth sucker (Green and White rivers), and roundtail chub (Green and White rivers). The Alternative II-D 250-foot-wide transmission line ROW would cross two streams (Green and White rivers) that contain one or more of these species. No direct disturbance to their habitat would be expected due to the relatively large size of these streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in two streams during construction would be of a low magnitude. Road disturbance and effects on habitat for these species would not be expected for these larger streams.

Mountain Sucker (BLM Sensitive)

The Alternative II-D 250-foot-wide transmission line ROW would cross two streams (Mud Creek and the San Pitch River) containing mountain sucker. Habitat loss could be 800 ft^2 (0.02 acre), if culverts or low water construction are required in these streams. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in two streams during construction would be of a low magnitude. If a culvert or road is constructed across Mud Creek and the San

Pitch River, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

USFS Sensitive Species

Seven streams and two reservoirs in the Manti-LaSal National Forest occur within the Alternative II-D 2-mile transmission line corridor (**Appendix G**, **Table G-13**). Two streams (Huntington and Cottonwood creeks) contain USFS sensitive species, Bonneville cutthroat trout (Huntington Creek) and Colorado River cutthroat trout (Cottonwood Creek). Cottonwood Creek would be crossed by the 250-foot-wide transmission line ROW, which could result in direct loss of aquatic habitat of 400 ft^2 (0.01 acre), if culverts or low water construction is required. By following the Forest management guidance involving avoidance of riparian areas near streams, effects on riparian vegetation and sediment input would be minimized.

Alternative II-E

In total, 17 streams (Bennie, Clear, Cottonwood, Dry Gulch, Kyune, Lake Fork, Montes, Nebo, Soldier, Tabbyune, Thistle, Tie Fork, and West Fork Willow creeks and the Duchesne, Green, Uinta, and White rivers) are located within the 2-mile transmission line corridor that contains special status aquatic species. Except for Clear, Kyune, and Tabbyune creek and the White River, these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-E.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Surface disturbance within the Alternative II-E 250-foot-wide transmission line ROW crossing near the Green River could affect 2 acres for both Colorado pikeminnow and razorback sucker. Indirect effects on Colorado pikeminnow and razorback sucker and on the downstream reaches occupied by all four federally endangered fish species would be the same as discussed for Alternative II-A.

In summary, Alternative II-E would cross 2 acres of critical habitat for both Colorado pikeminnow and razorback sucker in the Green River. Surface disturbance activities near the Green River pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 196 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 117 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Boreal Toad (Forest Sensitive Species and Colorado Endangered and Utah CAS)

Boreal toad habitat within the Sowers Creek drainage is located within the Alternative II-E 2-mile transmission line corridor and would be crossed 15 times by the 250-foot-wide transmission line ROW. Potential breeding habitat for this toad species could be disturbed by vehicle crossings or culvert construction in Sowers Creek (6,000 ft^2 or 0.14 acre for 15 crossings). Vehicle traffic within the 2-mile transmission line corridor also could disturb upland habitat used by this toad species during non-breeding periods. By applying a 2-mile dispersal distance around Sowers Creek, potential effects could occur within

approximately 28,536 acres. Vehicle traffic could cause mortalities to boreal toads, if construction activities overlap with dispersal periods to and from Sowers Creek. However, mortalities are expected to be minor due to low traffic volumes. Indirect effects involving sedimentation and potential fuel spills on breeding habitat in Sowers Creek would be minimized by BMPs and design features for erosion control and refueling restrictions near waterbodies. The following mitigation measure is proposed to reduce potential direct disturbance on breeding habitat for boreal toad.

SSS-7 *(Reduce Crossings of Sowers Creek to Protect Boreal Toad Breeding Habitat): The ROW alignment would be evaluated so that the number of Sowers Creek crossings can be reduced. The portion of the creek that would be crossed by the ROW also would be evaluated as breeding habitat for boreal toad to identify any priority areas that should be avoided if possible.*

Effectiveness: This measure would be highly effective in reducing direct disturbance effects on breeding habitat for boreal toad.

In summary, implementation of BMPs, design features, and additional mitigation measure **SSS-7** would minimize direct and indirect effects to a minor level for boreal toad.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Two streams, Soldier Creek and the White River, with northern leopard frog habitat would be crossed by the Alternative II-E 250-foot-wide transmission line ROW. The 250-foot-wide transmission line ROW crossings are five for Soldier Creek and one for the White River. Potential impacts would consist of habitat disturbance and mortalities due to construction traffic. Potential loss of habitat would be 2,000 ft^2 (0.05 acre), if culverts are used at the Soldier Creek 250-foot-wide transmission line ROW crossings. BMPs and design features would be implemented to minimize effects of construction activities and on northern leopard habitat. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Seven streams consisting of Bennie, Clear, Lake Fork, Nebo, Soldier, Thistle, and Tie Fork creeks would be crossed by the Alternative II-E 2-mile transmission line corridor. There are eight 250-foot-wide transmission line ROW crossings for these streams. Potential loss of habitat would be 3,200 ft^2 (0.07 acre), if culverts or low water construction is required. Indirect effects of instream work or surface disturbance near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species, as discussed for Alternative II-A. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in seven streams during construction would be of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Five streams that contain Colorado River cutthroat trout would be crossed by the 2-mile transmission line corridor (Kyune, Tabbyune, and West Fork Willow creeks and the Green and White rivers). The Green and White rivers are the only streams that would be crossed by the 250-foot-wide transmission line ROW. There would be no direct loss of habitat from construction activities at these large river crossings. BMPs, design features, and mitigation measure **SSS-2** would minimize effects to Colorado River cutthroat trout.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Hop, Soldier, and Thistle creeks) contain southern leatherside chub habitat and would be crossed by the transmission line corridor. Potential effects of construction and maintenance operations on southern leatherside chub habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 2,800 ft^2 (0.06 acre), if culverts or low water construction is required. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub along with mitigation measure **SSS-4**. By implementing these protection measures, effects on southern leatherside chub habitat during construction would be of a low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following number of streams that contain these sucker and chub species would be crossed by the 2-mile transmission line corridor for Alternative II-E: seven streams (Cottonwood Creek, Dry Gulch Creek, Duchesne River, Green River, Montes Creek, Uinta River, and White River) each for bluehead sucker, flannelmouth sucker, and roundtail chub. The Alternative II-E 250-foot-wide transmission line ROW would cross six streams (Duchesne, Green, Uinta, and White rivers and Dry Gulch and Montes creeks) that contain one or more of these species. Habitat loss could be 1,200 ft^2 (0.03 acre) for each of these species, if culverts or low water construction are required in the smaller streams such as Dry Fork and Montes creeks. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in seven streams during construction would be of a low magnitude. Road disturbance and effects on habitat for these species would not be expected for the larger streams.

Mountain Sucker (BLM Sensitive)

The Alternative II-E 250-foot-wide transmission line ROW would cross one stream (Soldier Creek) containing mountain sucker. Habitat loss could be 2,000 ft^2 (0.05 acre), if culverts or low water construction are required at the five 250-foot-wide transmission line ROW crossings. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in one stream during construction would be of a low magnitude. If a culvert or road is constructed across Soldier Creek, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction conditions resulting in construction impacts of relatively low net magnitude.

Southern Bonneville Pyrg (Utah Protected)

One unnamed spring near Thistle Creek containing the springsnail, southern Bonneville pyrg, is located within the Alternative II-E 2-mile transmission line corridor. The spring would not be crossed by the 250-foot-wide transmission line ROW. Potential impacts to this special status springsnail would be the same as discussed for Alternative II-A. BMPs, design features, and mitigation measure **SSS-5** would avoid direct habitat impacts and minimize water quality effects from sedimentation or spills on springsnail habitat. Indirect effects to southern Bonneville pyrg habitat could occur in an unnamed spring near Thistle Creek due to vehicle traffic. Mitigation measure **SSS-5** would be implemented to avoid direct impacts to this springsnail species and its habitat.

USFS Sensitive Species

The Alternative II-E 2-mile transmission line corridor overlaps with waterbodies in the following national forests: Uinta-Wasatch-Cache (Indian, Sheep, and Tie Fork creeks), Manti-LaSal (Long Hollow, Lookout,

and Sky High springs), and Ashley (Sowers Creek). One of these waterbodies (Tie Fork Creek) contains the USFS sensitive species, Bonneville cutthroat trout. Potential direct loss of aquatic habitat includes 400 ft^2 (0.01) if culverts or low water construction is required. A stipulation for the Uinta-Wasatch-Cache National Forest requires that no actions affect cutthroat trout in Tie Fork Creek, Therefore, direct disturbance to habitat or other indirect effects involving sediment or fuel spills would not be allowed in Tie Fork Creek. Sediment input and riparian disturbance would be avoided by following the Uinta-Wasatch-Cache National Forest stipulation that requires a 300-foot buffer along perennial streams.

Alternative II-F (Agency Preferred)

Eighteen streams with special status aquatic species are located within the Alternative II-F 2-mile transmission line corridor (Bennie, Clear, Hop, Kyune, Kyune Creek Right Fork, Lake Fork, Nebo, Soldier, Tabbyune, Thistle, Tie Fork, West Fork Willow, and Willow creeks, White River Fork and White River [tributaries to the Price River], and the Green, Price, Sevier, and White rivers). Eleven of these streams (Hop, Lake Fork, Soldier, Tabbyune, Thistle, Tie Fork, and Willow creeks, White River [tributary to the Price River], and the Green, Sevier, and White rivers) also would be crossed by the 250-foot-wide transmission line ROW. Species-specific effects are discussed below for Alternative II-F.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Surface disturbance within the Alternative II-F 250-foot-wide transmission line ROW crossing could affect critical habitat within the 100-year floodplain of the Green and White rivers. Potential disturbance could include 4 acres for Colorado pikeminnow (1 acre in the White River and 3 acres in the Green River) and 3 acres for razorback sucker in the Green River. Indirect effects on Colorado pikeminnow and razorback sucker and downstream reaches containing these two species plus bonytail and humpback chub would be the same as discussed for Alternative II-A.

In summary, critical habitat for Colorado pikeminnow and razorback sucker could be affected by project construction within the 100-year floodplain of the Green and White river crossings by the 250-foot-wide transmission line ROW. In total, approximately 4 and 3 acres, respectively, could be affected for these species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally listed species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 197 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 117 acre-feet of construction water use would occur within the Colorado River Basin. Specific water sources would be evaluated to determine if there are connections to surface water in the Upper Colorado River Basin, which provides habitat for four federally listed fish species. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the federally listed fish species in the Upper Colorado River Basin.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Northern leopard frog habitat associated with Soldier Creek and the White River crossings by the Alternative II-F 250-foot-wide transmission line ROW potentially could be disturbed by construction vehicles and equipment. Potential impacts would consist of habitat disturbance associated with up to five Soldier Creek crossings and mortalities due to construction traffic. Potential habitat loss or alteration would be

2,000 ft^2 (0.05 acre), if culverts or low water construction occurs at the Soldier Creek crossings. BMPs and design features would be implemented to minimize effects of construction activities on this amphibian species. Vehicle traffic near Soldier Creek and the White River could cause mortalities, if traffic coincides with movement periods to and from aquatic habitat.

Bonneville Cutthroat Trout (BLM and Forest Sensitive and Utah Protected and CAS)

Seven streams with habitat for Bonneville cutthroat trout would be crossed by the Alternative II-F 2-mile transmission line corridor (Bennie, Clear, Lake Fork, Nebo, Soldier, Thistle, and Tie Fork creeks). Habitat could be altered at four of these streams, with the number of 250-foot-wide transmission line ROW crossings noted in parentheses: Lake Fork (1), Soldier (5), Thistle (1), and Tie Fork (1). Potential loss of habitat could be 3,200 ft^2 (0.07 acre), if culverts or low water construction is required. Indirect effects of construction on habitat for this species could include sedimentation or fuel spills. The same BMPs and design features discussed for game fish species would be implemented for streams containing Bonneville cutthroat trout. Mitigation measure **SSS-3** also would be applied to the seven streams containing spawning habitat for this species. By implementing BMPs, design features, and additional mitigation, impacts would be reduced for streams containing Bonneville cutthroat trout. Construction of culverts could remove a small amount of habitat for this species in four streams. Mitigation measure **SSS-3** would avoid direct impacts to Bonneville cutthroat trout spawning during construction.

Colorado River Cutthroat Trout (BLM and Forest Sensitive and Utah CAS)

Nine streams that contain Colorado River cutthroat trout would be crossed by the Alternative II-F 2-mile transmission line corridor (Kyune, Kyune Creek Right Fork, Tabbyune, West Fork Willow, and Willow creeks, White River and White River Right Fork [tributaries to the Price River], and the Green and White rivers). Five of these streams (Green and White rivers, Tabbyune Creek, Willow Creek, and the White River [tributary to the Price River]) would be crossed by the 250-foot-wide transmission line ROW. Potential loss or alteration of approximately 1,200 ft^2 (0.03 acre) of habitat could occur if a culvert or low water construction is required in Tabbyune and Willow creeks and the White River (Price River tributary). Other direct and indirect effects of construction on cutthroat habitat would be the same as discussed for Alternative II-A. BMPs, design features, and mitigation measure **SSS-3** would minimize effects on Colorado River cutthroat trout. By implementing erosion control, spill prevention, and riparian protection BMPs and design features, other direct and indirect effects of construction on habitat for this cutthroat species would be of low magnitude.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Potential impacts from access road use could affect southern leatherside chub habitat in four streams located within the Alternative II-F 2-mile transmission line corridor (Hop, Soldier, and Thistle creeks and the Sevier River). Direct effects on habitat also could occur at four 250-foot-wide transmission line ROW crossings (one crossing each in Hop and Thistle creeks and two Sevier River crossings). Potential habitat loss or alteration would be approximately 1,600 ft^2 (0.04 acre), if culverts or low water construction are required. The same BMPs and design features discussed for other sensitive fish species also would be implemented for streams containing southern leatherside chub. In addition, mitigation measure **SSS-4** would avoid direct impacts to spawning chub. By implementing erosion control, spill prevention, and riparian protection BMPs and design features, other direct and indirect effects of construction on habitat for this chub species would be of low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

Two streams, the Green and White rivers, would be crossed by the Alternative II-F 2-mile transmission line corridor and 250-foot-wide transmission line ROW for these three special status sucker species. When considering multiple crossings of the White River, there would be total of four ROW crossings for the three species. There would be no direct loss or alteration of habitat, since vehicles or equipment would not cross or enter the Green and White rivers. Other indirect effects of construction on sucker habitat would be the

same as discussed for Alternative II-A. BMPs and design features would minimize effects on these three sucker species. In summary, by implementing erosion control, spill prevention, and riparian protection BMPs and design features, effects on special status sucker species in the Green and White rivers would be of low magnitude. Alternative II-F would cause direct loss of alteration of special status sucker habitat, since culverts or low water construction would not be used.

Mountain Sucker (BLM Sensitive)

Potential impacts from access road use could affect mountain sucker habitat in two streams located within the Alternative II-F 2-mile transmission line corridor (Soldier Creek and the Sevier River). Direct effects on habitat also could occur at seven 250-foot-wide transmission line ROW crossings (five Soldier Creek crossings and two Sevier River crossings). Potential habitat loss or alteration would be approximately 2,800 ft^2 (0.06 acre), if culverts or low water construction are required. Other effects on mountain sucker and its habitat would be the same as discussed for Alternative II-A. The same BMPs and design features for sediment control, spill prevention, and riparian protection discussed for other special status fish species would be implemented for construction near streams containing mountain sucker. By implementing erosion control, spill prevention, and riparian protection BMPs and design features, other direct and indirect effects of construction on mountain sucker habitat would be of low magnitude.

Southern Bonneville Pyrg (Utah Protected)

One unnamed spring near Thistle Creek containing the springsnail, southern Bonneville pyrg, is located within the Alternative II-F 2-mile transmission line corridor. The spring would not be crossed by the 250-foot-wide transmission line ROW. Potential impacts to this special status springsnail would be the same as discussed for Alternative II-A. BMPs, design features, and mitigation measure **SSS-5** would avoid direct habitat impacts and minimize water quality effects from sedimentation or spills on springsnail habitat.

USFS Sensitive Species

The Alternative II-F 2-mile transmission line corridor would cross two streams (Tie Fork and Soldier creeks) in the Uinta-Wasatch-Cache National Forest (**Appendix G**, **Table G-13**). Both streams contain USFS sensitive species, Bonneville cutthroat trout and southern leatherside chub. The 250-foot-wide transmission line ROW for Alternative II-F would only cross Tie Fork Creek. Potential direct loss or alteration of habitat in Tie Fork Creek would be 400 ft^2 (0.01 acre), if a culvert or low water crossing is required. However, Uinta-Wasatch-Cache National Forest stipulations require that no actions affect cutthroat trout populations in Tie Fork Creek. Impacts on riparian vegetation would be avoided by a stipulation that requires a 300-foot buffer along perennial streams. BMPs and design features involving sediment control and spill prevention would be implemented during construction to minimize adverse effects on water quality in the two streams inhabited by Bonneville cutthroat trout and southern leatherside chub.

<u>Alternative Variation in Region II</u>

Emma Park Alternative Variation

Potential impacts of constructing the Emma Park Alternative Variation on special status aquatic species would be similar to the comparable portion of Alternative II-F, based on the number of streams located within the 2-mile transmission line corridors that contain special status species. In total, four streams (Kyune, Kyune Right Fork, Tabbyune, and White River Right Fork) are located within the 2-mile transmission line corridor for the Emma Park Alternative Variation and the comparable portion of Alternative II-F. All of these streams contain the special status species, Colorado River cutthroat trout. There would be a slightly greater risk of sediment input to Kyune and Tabbyune creeks as a result of 250-foot-wide transmission line ROW crossings by the Emma Park Alternative Variation. However, erosion control measures would be implemented to reduce sediment-related impacts for the Emma Park Alternative Variation and Alternative II-F.

Alternative Connectors in Region II

The Castle Dale, Highway 191, Price, Lyndyll, and IPP East alternative connectors would have no impacts on special status aquatic species, since these alternatives would not cross streams that support habitat for special status fish, amphibian, or invertebrate species.

Region II Conclusion

Based on a comparison of impact parameters for Region II alternatives, potential impacts to special status aquatic species would be greatest for Alternative II-A (Applicant Proposed), II-E, and II-F (Agency Preferred). Potential effects for Alternatives II-B, II-C, and II-D would be similar and lower compared to Alternatives II-A, II-E, and II-F (**Table 3.10-13**). Alternatives II-A, II-E, and II-F would cross the highest number of streams with special status aquatic species (17 or 18) and potential alteration or loss of habitat (upper end of range for some species being 2,800 to 6,000 ft^2 or 0.06 to 0.14 acre). In comparison, the other three alternatives would cross 7 to 12 streams with special status aquatic species and result in loss or alternation of habitat of 1,200 to 2,800 ft^2 or 0.03 to 0.06 acre (upper end of range for some species). Less than 0.1 percent of special status species habitat would be affected by each of the six alternatives. Potential effects on critical habitat for federally listed fish species (Colorado pikeminnow and razorback sucker) would be similar for all alternatives (2 to 4 acres that would be crossed by the 250-foot-wide transmission line ROW). Potential disturbance to riparian areas near streams containing special status aquatic species would be similar for all alternatives (**Table 3.10-14**). Alternatives II-A and II-E also would result in increased new road density in 13 and 12 watersheds, respectively, compared to 8 or 11 watersheds for the other alternatives (**Table 3.10-15**). Alternative II-F (Agency Preferred) could affect road densities in 11 watersheds. Even though the greatest level of impacts are associated with Alternatives II-A, II-E, and II-F, project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.4 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.5 Region III

Table 3.10-16 provides a summary of impact parameters used to describe impacts for alternative routes in Region III. Based on species occurrence information and habitat associations, special status aquatic species that were analyzed by the proposed Project in Region III included two amphibians, nine fish, and one invertebrate species (**Table 3.10-6**). Species occurrence in Region III streams is provided in **Appendix G**, **Tables G-8** for streams and **G-9** for waterbodies. Project Segment ID numbers referenced in this section are listed in **Tables G-8** and **G-9** and depicted in **Figure 2-23**. Parameter information in **Table 3.10-16** is discussed separately for each of the Region III alternatives.

Table 3.10-16 Summary of Region III Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	4	3	1
Number of streams with special status aquatic species that would be crossed by 2-mile transmission line corridors or located within 2 miles downstream of corridor boundaries	4	3	1
Number of streams with federally listed aquatic species[1] that would be crossed by 250-foot-wide transmission line ROWs	1	1	0
Acres of critical habitat for federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	0	0	0

Table 3.10-16 Summary of Region III Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Potential Aquatic Habitat Alteration or Loss[2] (ft^2) (acres shown in parentheses)			
Virgin River chub	400 (0.01)	400 (0.01)	0
Virgin River spinedace	1,200 (0.03)	0	0
Bluehead sucker	400 (0.01)	0	0
Roundtail chub	400 (0.01)	0	0
Meadow Valley Wash desert sucker	400 (0.01)	1,200 (0.03)	400 (0.01)
Meadow Valley Wash speckled dace	400 (0.01)	1,200 (0.03)	400 (0.01)
Moapa speckled dace	400 (0.01)	400 (0.01)	0
Moapa White River springfish	400 (0.01	400 (0.01)	0
Arizona toad	800 (0.02)	400 (0.01)	400 (0.01)

[1] Federal listing is under review for Virgin River chub.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment.

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-17** and **3.10-18**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-17 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region III Corridor

	Alternatives					
	III-A		III-B		III-C	
Streams	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Construction	6	20	7	21	2	8
Operation	2	6	2	5	1	2

- Riparian Disturbance – A comparison of the construction and operation effects to riparian vegetation near streams containing special status aquatic species indicates that Alternatives III-A and III-B would have the highest acres of potential disturbance. However, these impacts would be reduced by BLM and USFS stipulation requirements that range from avoiding a buffer area of 200 to 1,200 feet adjacent to perennial streams to total avoidance of riparian areas. In conclusion, the disturbance to riparian vegetation would be avoided on BLM and USFS lands. There could be disturbance on private lands.
- Road Density – The number of watersheds that would be crossed by the Region III alternative 250-foot-wide transmission line ROWs range from 1 (III-C) to 3 (III-B). The road density units are highest for Alternative III-B. The increase in new road density ranged from <0.1 to 0.4 mile/mile^2, with the highest density increase in the Lower Meadow Valley Wash watershed (Alternative III-B). BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

Table 3.10-18 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region III Corridor

Watershed	III-A Current Density 100 feet	III-A Current Density 300 feet	III-A Density Increase 100 feet	III-A Density Increase 300 feet	III-A Streams with Special Status Species (# of Segments)	Watershed	III-B Current Density 100 feet	III-B Current Density 300 feet	III-B Density Increase 100 feet	III-B Density Increase 300 feet	III-B Streams with Special Status Species (# of Segments)
Lower Muddy River	1.70	2.80	0.11	0.23	Muddy River	Clover Creek	7.75	5.63	0	0	Clover Creek (1)
Moody Wash	2.09	3.02	0	0	Magotsu Creek (1), Moody Wash (1), Spring Creek (1)	Lower Meadow Valley Wash	0.38	1.00	0.31	0.36	Meadow Valley Wash (1)
						Upper Muddy River	1.02	1.92	0.07	0.09	Muddy River (1)

Watershed	III-C Current Density 100 feet	III-C Current Density 300 feet	III-C Density Increase 100 feet	III-C Density Increase 300 feet	III-C Streams with Special Status Species (# of Segments)
Cathedral Gorge-Meadow Valley Wash	5.05	4.66	0	0	Meadow Valley Wash (1)

Note: Zero indicates no new roads within the buffer area.

Alternative III-A (Applicant Proposed)

In total, four streams (Magotsu Creek, Spring Creek, Moody Wash, and the Muddy River) are located within the 2-mile transmission line corridor that contains special status aquatic species. All four streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative III-A.

Virgin River Chub (Federally Endangered and BLM Sensitive)

The 250-foot-wide transmission line ROW and transmission line for Alternatives III-A would cross one stream, the Muddy River, which contains Virgin River chub. The types of impacts that could result from vehicle traffic and equipment disturbance within the ROW and access roads would be the same as discussed for other fish species. Direct disturbance to habitat would occur if vehicles cross the river, culverts are constructed, or riparian vegetation is removed during construction. Habitat loss could be 400 ft^2 (0.01 acre), if culverts or low water construction is required. Indirect effects involving sedimentation or fuel spill risks would result from disturbance near the Muddy River. BMPs and design features would minimize erosion effects on waterbodies and restrict refueling within 100 feet of the Muddy River. The following mitigation measure is proposed to avoid vehicle crossing and road disturbance effects on this species:

SSS-8 *(No Vehicle Crossings or New Roads in the Muddy River): No vehicle crossings or new roads would be constructed for the Muddy River. This measure would protect habitat for special status fish species (Virgin River chub, Moapa speckled dace, Moapa White River springfish, Meadow Valley Wash desert sucker, and Meadow Valley Wash speckled dace) in the Muddy River.*

Effectiveness: This measure would be highly effective in avoiding direct disturbance to habitat for special status fish species in the Muddy River.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Virgin River chub habitat in the Muddy River during construction would be of a low magnitude. Direct impacts on Virgin River chub habitat would be avoided by implementing mitigation measure **SSS-8**.

Virgin River Spinedace (BLM Sensitive, Nevada Protected, and Utah CAS)

Three streams containing Virgin River spinedace, Magotsu Creek, Moody Wash, and Spring Creek in Utah, would be crossed by the Alternative III-A 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Direct disturbance to habitat could occur if vehicles cross these streams or culverts are constructed. Direct loss of habitat could be 1,200 ft^2 (0.03 acre), if culverts or low water construction is required. Indirect effects on this species would be the same as discussed for other fish species. The same BMPs and design features would be implemented to reduce impacts from erosion and fuel spills. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Virgin River spinedace habitat during construction would be of a low magnitude. If roads are constructed across Magotsu and Spring creeks or Moody Wash, construction would directly disturb habitat for this species. Disturbed habitat from any instream construction would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude. Culvert installation would be a permanent loss of habitat.

Bluehead Sucker and Roundtail Chub (BLM Sensitive and Utah CAS)

Potential impacts to these two fish species could occur as a result of the Alternative III-A 250-foot-wide transmission line ROW crossings and potential access road use within the transmission line corridor at the Magotsu Creek crossing. Direct and indirect effects would be the same as discussed for other fish species such as the Virgin River spinedace. Direct loss of habitat could be 400 ft^2 (0.01 acre) for each species, if a culvert or low water construction is required. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects from erosion and fuel spill effects. By implementing erosion control and spill prevention BMPs and design features, water quality effects on bluehead sucker and

roundtail chub habitat during construction would be of a low magnitude. If roads are constructed across Magotsu Creek, construction impacts would occur to habitat for this species. Disturbed habitat from instream construction would be restored to pre-construction conditions resulting in construction impacts of a relatively low magnitude. A culvert installation would result in permanent loss of habitat.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace (BLM Sensitive and Nevada Protected)

Construction activities could adversely affect habitat for these two species at the Muddy River crossing. Direct loss of habitat could be 400 ft^2 (0.01 acre) for each species if a culvert or low water construction is required. The same BMPs and design features and additional mitigation measure **SSS-8** would be implemented to minimize direct and indirect impacts on these species. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat in the Muddy River would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

Moapa Speckled Dace and Moapa White River Springfish (Nevada Protected)

Construction activities could adversely affect habitat for these two species at the Muddy River crossing. Habitat loss could be 400 ft^2 (0.01 acre) for each species, if a culvert is used. The same BMPs and design features and additional mitigation measure **SSS-8** would be implemented to minimize direct and indirect impacts on these species. By implementing mitigation measure **SSS-8**, there would be no direct loss of habitat.

Arizona Toad (BLM Sensitive and Utah Protected and CAS)

This species, also commonly referred to as the southwestern toad, has been collected in standing water with marsh or riparian vegetation within Meadow Valley Wash (BIO-WEST 2005). It also is known to occur in gravelly areas of streams and arroyos in the drier portion of range; often on the sandy banks of quiet water in other areas. This species also occurs in Abe and Hiway springs, Magotsu Creek, and Moody Wash, which are located within the 2-mile transmission line corridor for Alternative III-A. Vehicle traffic on access roads near marsh or riparian vegetation could result in mortalities to toads particularly during movement to breeding habitat consisting of wet areas. Risk of effects also could occur within approximately 9,850 acres of terrestrial habitat by applying a 2-mile dispersal distance around Magotsu Creek and Moody Wash. Vehicle traffic also could result in sediment input and fuel spill risks to habitat for Arizona toad. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects from erosion and fuel spill effects. The following mitigation measure is proposed to protect breeding habitat in springs used by Arizona toad.

SSS-9 *(Avoid Direct Disturbance to Abe and Hiway Springs Used by Arizona Toad): No vehicle or equipment disturbance from ROW work or access road construction would be allowed in Abe and Hiway Springs to protect Arizona toad breeding habitat.*

BMPs and design features would be implemented to minimize effects of construction activities and on Arizona toad habitat. Impacts from these activities during construction would be considered of a low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with toad movements during breeding periods. Mitigation measure **SSS-9** would protect breeding habitat in Abe and Hiway springs.

Moapa Warm Springs Riffle Beetle (BLM Sensitive)

The Moapa Warm Springs riffle beetle is restricted to the Warm Springs area within the Muddy River. Direct and indirect impacts could occur if construction activities occur within or near the Warm Springs area that would be crossed by the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for Alternative III-A. The same BMPs and design features would be implemented to minimize direct impacts on

habitat and indirect effects from erosion and fuel spill effects. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Moapa Warm Springs riffle beetle habitat in the Muddy River during construction would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

USFS Sensitive Species

No USFS sensitive species occur in the two perennial streams and six springs that are located within the Alternative III-A transmission line corridor in the Dixie National Forest (**Appendix G**, **Table G-13**).

Alternative III-B (Agency Preferred)

In total, three streams (Clover Creek, Meadow Valley Wash, and the Muddy River) that contain special status aquatic species are located within the Alternative III-B 2-mile transmission line corridor. All three of these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative III-B.

Virgin River Chub (Federally Endangered and BLM Sensitive)

The potential impacts of constructing and maintaining Alternative III-B on Virgin River chub would be the same as those discussed for Alternative III-A. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Virgin River chub habitat in the Muddy River during construction would of a low magnitude. Direct impacts on Virgin River chub habitat would be avoided by implementing mitigation measure **SSS-8**.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace (BLM Sensitive and Nevada Protected)

The 250-foot-wide transmission line ROW and 2-mile transmission line corridor would cross habitat for these two species in Meadow Valley Wash and the Muddy River. Direct loss of habitat could be 1,200 ft^2 (0.03 acre) for both species, if a culvert or low water construction is required. Mitigation measure **SSS-8** would avoid direct effects to habitat in the Muddy River. Vehicle crossings or new road construction could adversely affect habitat in Meadow Valley Wash. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat would be of a low magnitude. If roads are constructed across Meadow Valley Wash, construction impacts would occur to habitat for this species. Disturbed habitat would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude. Direct effects to habitat in the Muddy River would be avoided by mitigation measure **SSS-8**.

Moapa Speckled Dace and Moapa White River Springfish (Nevada Protected)

The potential impacts of constructing and operating Alternative III-B on Virgin River chub are the same as discussed for Alternative III-A. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat in the Muddy River would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

Arizona Toad (BLM Sensitive and Utah Protected and CAS)

Meadow Valley Wash would be crossed by the transmission line corridor for Alternative III-B. Vehicle traffic on access roads near marsh or riparian vegetation could result in mortalities to toads particularly during movement to breeding habitat consisting of wet areas. Direct loss of habitat could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required. Risk of effects also could occur within approximately 7,900 acres of terrestrial habitat by applying a 2-mile dispersal distance around Meadow Valley Wash. Vehicle traffic also could result in sediment input and fuel spill risks to habitat for Arizona toad. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects

from erosion and fuel spill effects. Impacts from construction activities would be considered of a low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with toad movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Moapa Warm Springs Riffle Beetle (BLM Sensitive)

The potential impacts of constructing and maintaining Alternative III-B on Moapa Warm Springs riffle beetle are the same as discussed for Alternative III-A. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Moapa Warm Springs riffle beetle habitat in the Muddy River during construction would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

USFS Sensitive Species

No NFS lands would be crossed by the Alternative III-B 2-mile transmission line corridor or 250-foot-wide transmission line ROW.

Alternative III-C

One stream (Meadow Valley Wash) that contains special status aquatic species is located within the Alternative III-C 2-mile transmission line corridor. This stream also would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative III-C.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace (BLM Sensitive and Nevada Protected)

Vehicle crossings or new road construction could detrimentally affect habitat in Meadow Valley Wash. Habitat loss could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat would be of a low magnitude. If roads are constructed across Meadow Valley Wash, construction impacts would occur to habitat for this species. Disturbed habitat would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude. Culvert installation would result in a permanent loss of habitat.

Arizona Toad (BLM Sensitive and Nevada Protected)

Arizona toad habitat would be crossed by the Alternative III-C 250-foot-wide transmission line ROW in Meadow Valley Wash. Potential impacts of construction and operation would be the same as discussed for Alternative III-B. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects from erosion and fuel spill effects. Impacts from these activities would last through construction and be considered of low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with toad movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

The Alternative III-C 2-mile transmission line corridor would cross through the Pahranagat National Wildlife Refuge, which contains habitat for the northern leopard frog. Although there is no northern leopard frog habitat within the 2-mile transmission line corridor, the species occurs in Maynard Spring located approximately 600 feet west of the corridor. Since the spring is located outside of the transmission line corridor, project construction and road access would not affect habitat or movements to and from breeding areas for northern leopard frog in the Pahranagat National Wildlife Refuge. Furthermore, northern leopard frog would not be expected to disperse from the Refuge springs into the transmission line corridor due to the lack of waterbodies. In conclusion, Alternative III-C would not affect northern leopard frog.

USFS Sensitive Species

No NFS lands would be crossed by the Alternative III-C 2-mile transmission line corridor or 250-foot-wide transmission line ROW.

Alternative Variations in Region III

The Ox Valley East and West alternative variations 250-foot-wide transmission line ROW and 2-mile transmission line corridor would cross one stream (Spring Creek) that contains one special status species (Virgin River spinedace). The comparable portion of III-A would cross two streams, Spring and Magotsu creeks. Special status species in Magotsu Creek includes Arizona toad, Virgin River spinedace, bluehead sucker, flannelmouth sucker, and roundtail chub. Two springs, Abe and Hiway, also are located adjacent to the III-A 250-foot-wide transmission line ROW. These springs contain habitat for Arizona toad.

The Pinto Alternative Variation would cross two streams (Magotsu Creek and the Santa Clara River) that contain special status species Arizona toad, bluehead sucker, flannelmouth sucker, roundtail chub, and Virgin spinedace. The comparable portion of Alternative III-A would cross one stream (Spring Creek) with special status species, Virgin River spinedace.

Alternative Connectors in Region III

No perennial streams would be crossed by the Avon and Moapa Alternative Connectors in Region III.

Alternative Ground Electrode Systems in Region III

The southern electrode system would be required within 100 miles of the southern terminal, which is based on the conceptual locations and connections to the alternative routes. There would be no impacts on special status aquatic species, since the conceptual locations do not support habitat for fish, amphibian, or invertebrate species.

No Forest sensitive species occur in the streams or springs that would be crossed by alternative variations on NFS lands in Region III (**Appendix G**, **Table G-14**).

Region III Conclusion

Based on a comparison of impact parameters for Region III alternatives, potential impacts to special status aquatic species would be greatest for Alternatives III-A and III-B. Potential effects for Alternatives III-C would be relatively low compared to Alternatives III-A and III-B (**Table 3.10-16**). Alternative III-A and III-B would cross the highest number of streams with special status aquatic species (4 and 3, respectively). In addition, Alternatives III-A and III-B also could result in the greatest potential alteration or loss of habitat (upper end of range being 1,200 ft^2 or 0.03 acre for several species). In comparison, Alternative III-C would cross one stream with special status aquatic species and disturb less habitat (upper end of range being 400 ft^2 or 0.01 acre for several species). Less than 0.1 percent of special status species habitat would be affected by each of the three alternatives. Alternatives III-A and III-B could result in the highest potential construction disturbance to riparian areas (6 and 7 acres at a 100-foot buffer and 20 and 21 acres at a 300-foot buffer, respectively) compared to Alternative III-C (2 acres at a 100-foot buffer and 8 acres at a 300-foot buffer) (**Table 3.10-17**). Alternative III-B also would result in increased new road density in three watersheds compared to one or two watersheds for the other two alternatives (**Table 3.10-18**). The highest increase in road densities also could occur as a result of Alternative III-B. Even though the greatest level of impacts are associated with Alternatives III-A or III-B, project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.5 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.6 Region IV

Table 3.10-19 provides a summary of impact parameters used to describe impacts for alternative routes in Region IV. Based on species occurrence information and habitat associations, special status aquatic species that may be impacted by the proposed Project in Region IV includes one fish species (**Table 3.10-7**). Species occurrence in Region IV streams is provided in **Appendix G**, **Tables G-10** for streams and **G-11** for waterbodies. Project Segment ID numbers referenced in this section are listed in **Tables G-10** and **G-11** and depicted in **Figure 2-24**. Parameter information in **Table 3.10-19** is discussed separately for each of the Region IV alternatives.

Table 3.10-19 Summary of Region IV Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	1	0	0
Number of streams with special status aquatic species that would be crossed by 2-mile-wide transmission line corridors or located within 2 miles downstream of corridor boundaries	1	1	1
Number of streams with federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	1	0	0
Acres of critical habitat for federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	0	0	0

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-20** and **3.10-21**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-20 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region IV Corridor

	Alternatives					
	IV-A		IV-B		IV-C	
Streams	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Construction	1	2	2	5	1	3
Operation	<1	<1	1	2	<1	1

- Riparian Disturbance – A comparison of the construction and operation effects to riparian vegetation near streams containing special status aquatic species indicates that Alternative IV-B would have the highest acres of potential disturbance. However, these impacts would be reduced by BLM stipulations that range from avoiding a buffer area of 300 to 500 feet adjacent to perennial streams to total avoidance of riparian areas. In conclusion, the disturbance to riparian vegetation would be avoided on BLM lands. There could be disturbance on private lands.
- Road Density – Two watersheds would be crossed by the Region IV alternative 250-foot-wide transmission line ROWs. The road density units are highest for Alternative IV-A. The increase in new road density ranged from 0 to 0.2 mile/mile^2, with the highest increase in the Duck Creek-Las Vegas Wash watershed (Alternative IV-A). BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

Table 3.10-21 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region IV Corridor

Watershed	IV-A Current Density 100 feet	IV-A Current Density 300 feet	IV-A Density Increase 100 feet	IV-A Density Increase 300 feet	IV-A Streams with Special Status Species (# of Segments)
Duck Creek-Las Vegas Wash	2.93	4.39	0.16	0.09	Las Vegas Wash (1)

Watershed	IV-B Current Density 100 feet	IV-B Current Density 300 feet	IV-B Density Increase 100 feet	IV-B Density Increase 300 feet	IV-B Streams with Special Status Species (# of Segments)
Government Wash-Colorado River	0.05	0.12	0	0	Las Vegas Wash (1)

Watershed	IV-C Current Density 100 feet	IV-C Current Density 300 feet	IV-C Density Increase 100 feet	IV-C Density Increase 300 feet	IV-C Streams with Special Status Species (# of Segments)
Government Wash-Colorado River	0.05	0.12	0	0	Las Vegas Wash (1)

Note: Zero indicates no new roads within the buffer area.

Alternative IV-A (Applicant Proposed and Agency Preferred)

The 250-foot-wide transmission line ROW and 2-mile transmission line corridor would cross one stream (Las Vegas Wash) that contains a special status fish species in a downstream area near Lake Mead. Species-specific impacts are discussed below for Alternative IV-A.

Razorback Sucker (Federally Endangered and BLM Sensitive)

The 250-foot-wide transmission line ROW and 2-mile transmission line corridor for Alternative IV-A would cross Las Vegas Wash. Razorback sucker occurs in the Lake Mead and Las Vegas Bay, which is located approximately 6 miles downstream of the Las Vegas Wash crossing. Construction activities within Las Vegas Wash would not adversely affect water quality or razorback sucker habitat in Las Vegas Bay due to the considerable distance between the crossing and Las Vegas Bay. Even if sediment entered Las Vegas Wash, wetland areas would filter and reduce any increased sediment levels.

Alternative IV-B

The 2-mile transmission line corridor would cross Las Vegas Wash, which contains one special status fish species in a downstream area near Lake Mead. Species-specific impacts are discussed below for Alternative IV-B.

Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction and maintenance activities would not affect razorback sucker due to habitat being located at least 2 miles downstream of the Las Vegas Wash crossing.

Alternative IV-C

The 2-mile transmission line corridor would cross Las Vegas Wash, which contains a special status fish species in a downstream area near Lake Mead. Species-specific impacts are discussed below for Alternative IV-C.

Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction and maintenance activities would not affect razorback sucker due to habitat being located at least 2 miles downstream of the Las Vegas Wash crossing.

Alternative Variations in Region IV

No waterbodies would be crossed by the Marketplace Alternative Variation in Region IV that contain special status aquatic species.

Alternative Connectors in Region IV

One alternative connector (River Mountain) could be utilized through various combinations to avoid crossing Las Vegas Wash. There is no advantage or disadvantage from the perspective of special status aquatic species, since Alternatives IV-A, IV-B, or IV-C would not affect razorback sucker. There are no apparent unique opportunities or constraints for special status aquatic species by utilizing the River Mountain Alternative connector.

Region IV Conclusion

Based on a comparison of impact parameters for Region IV alternatives, potential impacts to special status aquatic species would be similar. All three alternatives including IV-A (Applicant Proposed and Agency Preferred) would cross one stream with a special status aquatic species (**Table 3.10-19**). Less than 0.1 percent of special status species habitat would be affected by each of the four alternatives. Construction and operation disturbance on riparian habitat would be similar for the three alternatives, with values ranging from <1 to 5 acres (**Table 3.10-20**). There would be minor effects of road use on stream buffers for

Alternative IV-A, and no road effects on Alternatives IV-B and IV-C (**Table 3.10-21**). Project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.6 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.7 Impacts to Special Status Aquatic Species from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related disturbance would occur in waterbodies as a result of vehicle traffic or removal of riparian vegetation. No Project-related sedimentation or risks to aquatic species from potential fuel spills or introduction of invasive species would occur in the Project area. Impacts to aquatic habitat and species would continue at present levels as a result of natural conditions (e.g., annual fluctuations in stream flow due to varying precipitation, erosion, and wildfires) and existing development in drainages within the Project area.

3.10.6.8 Residual Impacts

- Potential loss or alteration of aquatic habitat for special status fish species in smaller streams that require culverts or vehicle crossings.
- Potential short-term sedimentation effects on aquatic habitat for special status species as a result of direct disturbance within or adjacent to streams from vehicle traffic.
- Potential loss or disturbance to riparian vegetation along streams containing special status fish species on private lands or public lands where the ROW is parallel and adjacent to streams.
- Potential special status amphibian mortalities from vehicle traffic during amphibian movements to and from waterbodies located within the ROWs.

3.10.6.9 Irreversible and Irretrievable Commitment of Resources

- Potential loss of aquatic habitat for special status fish species in streams that require culverts for vehicle crossings would be irretrievable. However, the habitat loss would be reversible if the culvert was removed at a later time.
- Potential amphibian mortalities from vehicle traffic would be an irretrievable and irreversible loss of a portion of amphibian populations.

3.10.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

The proposed action and alternatives would result in short-term disturbance to aquatic habitat and use of these habitats by aquatic species, but these effects would not affect the long-term productivity of special status fish, invertebrate, or amphibian populations.

3.11 Cultural Resources and Native American Concerns

Cultural resources are locations of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral history. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include locations (sites or places) of traditional, religious, and cultural importance to specified social and/or cultural groups. Cultural resources are material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit.

3.11.1 Regulatory Background

3.11.1.1 Historic Properties

Federal historic preservation laws provide a legal framework for documentation, evaluation, and protection of cultural resources that may be affected by federal undertakings. NEPA states that federal agencies shall take into consideration impacts to the environment with respect to an array of resources, and that alternatives must be considered. The courts have made clear that cultural resources are regarded as part of the environment and are to be considered under NEPA. The NHPA of 1966, as amended, established the ACHP and the NRHP, and mandates that federal agencies consider an undertaking's effects on cultural resources that are listed or eligible for listing on the NRHP. Cultural resources listed on or eligible for inclusion on the NRHP are referred to as historic properties. It should be noted that unevaluated cultural resources or those requiring additional data are treated as eligible for inclusion on the NRHP until final eligibility is determined. For the purposes of this EIS, the term "historic properties" will be used to be consistent with historic preservation laws and regulations.

In addition to the NHPA, other federal historic preservation laws include, but are not limited to:

- The Antiquities Act of 1906 (16 U.S.C. 431-433), which was the first general law providing protection for archaeological resources. The Act protects all historic and prehistoric sites on federal lands and prohibits excavation or destruction of such antiquities without the permission (antiquities permit) of the secretary of the department having jurisdiction.
- The Archaeological Resources Protection Act (ARPA) of 1979 (16 U.S. C. 470aa-mm) was enacted ..."to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals" (Sec. 2(4)(b)). The Act makes it illegal to excavate or remove from federal or Indian lands any archaeological resources without a permit from the land manager. Major penalties for violating the law include both fines and imprisonment.
- National Trails System Act of 1968 (P.L. 90-543 as amended through P.L. 111-11, March 30, 2009) established a national trails system to promote preservation of, public access to, travel within, and enjoyment of the open-air, outdoor areas, and historic resources of the nation. Furthermore, the Act designated initial trail system components and established methods and standards for adding additional components.

The ACHP is authorized by Section 211 of the NHPA to issue regulations to govern the implementation of Section 106 of the NHPA. These regulations, "Protection of Historic Properties" (36 CFR Part 800), establish the process that federal agencies must follow in order to take into account the effects of their undertakings on historic properties and provide the ACHP its required opportunity to comment. Section 106 establishes a four-step review process by which historic properties are given consideration during the conduct of federal undertakings.

The four steps are as follows:

1. Initiate the Section 106 process by establishing the undertaking, defining the Area of Potential Effect (APE), and consulting with the appropriate parties, including federal agencies, SHPOs, ACHP, Native American Tribes, local governments, interested parties, and the public;
2. Identify historic properties through inventory and evaluation;
3. Determine effects to historic properties using the criteria of adverse effects found in 36 CFR 800.5; and
4. If adverse effects occur, take appropriate measures to avoid, minimize, or mitigate those effects.

Regulations in 36 CFR 800 outline the process through which historic preservation legislation under the NHPA is administered. Regulations in 36 CFR 800.14 allow federal agencies to adopt program alternatives to 36 CFR 800 and to tailor the Section 106 process to better fit agency procedures or a specific project. The most common program alternative is a Programmatic Agreement (PA), which is negotiated between the federal agency, SHPO, and ACHP (if they choose to participate). A PA for a complex project lays out the steps the agency, SHPO, Native American Tribes, and other consulting parties agree to take to consider and resolve any adverse effects the Project might have on historic properties. A draft PA among BLM, Western, USFS, ACHP, Bureau of Reclamation, BIA, NPS, USFWS, TWE, and the Wyoming, Colorado, Utah, and Nevada SHPOs currently is being developed as allowed in 36 CFR 800.14 b(1) (ii) when effects on historic properties cannot be fully determined prior to approval of the undertaking. The draft PA outlines general and specific measures the federal agencies will take to fulfill their objectives and responsibilities regarding the protection of historic properties under the NHPA. Western and the BLM will consult with Native American Tribes and other consulting parties on the PA.

As part of the PA process, the BLM and Western sent letters to local governments, organizations, agencies, interested parties, and Native American Tribes in September 2011 inviting them to be consulting parties to the agreement. In addition, these groups were invited to participate in an all-day meeting on October 18, 2011, in Salt Lake City, Utah, to discuss the Project, Section 106, NEPA, and development of the draft PA. These groups included the following:

- Oregon-California Trail Association (OCTA)
- Alliance for Historic Wyoming
- The Old Spanish Trail Association
- Moffat County
- Mesa County
- Utah Governor's Public Lands Policy Coordination Office (PLPCO)
- Church History Department of the Church of Jesus Christ of Latter Day Saints (LDS Church)
- Milford Archaeological Research Institute
- Mountain Meadows Association
- Mountain Meadows Descendents
- Mountain Meadows Monument Foundation
- National Trust for Historic Preservation
- Utah Rock Art Research Association
- Utah Professional Archaeological Council (UPAC)
- Huntington Eccles Scenic Byway
- Utah Statewide Archaeology Society (USAS)
- Archaeo-Nevada Society
- Nevada Rock Art Foundation
- Nevada Archaeological Association (NAA)
- Lincoln County Chapter of the NAA
- Clark County Cultural Site Stewardship Program
- National Park Service

See Section 3.11.4.3 for a list of the Native American Tribes who were invited to the October 18, 2011, meeting.

Representatives of the OCTA, USAS, LDS Church, PLPCO, and Mountain Meadows Massacre Descendents were able to attend the meeting on October 18, 2011, in Salt Lake City. Two additional groups (NPS and Alliance for Historic Wyoming) participated in the meeting via conference call.

Consulting parties are defined by the NHPA regulations as "certain individuals and organizations with a demonstrated interest in the undertaking [who] may participate as consulting parties due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effect on historic properties" (36 CFR 800.2[c][5]). The regulations emphasize that the "views of the public are essential to informed Federal decision-making in the Section 106 process" (36 CFR 800.2[d][1]). Each of the consulting parties will be afforded an opportunity to participate in development of the draft PA and may be invited to participate as a concurring party. A concurring party concurs with the terms of the PA and may participate in implementing the stipulations of the PA or may benefit from the PA. It should be noted that consulting and concurring parties do not have authority to execute, amend, or terminate the PA; that authority is confined to the signatories (36 CFR 800.6[c][1]). For the Project, the signatories include BLM, Western, ACHP, USFS, Bureau of Reclamation, NPS, BIA, USFWS, TWE, and the Wyoming, Colorado, Utah, and Nevada SHPOs.

In addition to the organizations, local governments, interested parties, and agencies listed above, the BLM and Western have made a reasonable and good faith effort to identify and seek government-to-government consultation with federally recognized Native American Tribes with religious and cultural ties to the files search area that "attach religious and cultural significance to historic properties that may be affected by an undertaking" (Section 101[d][6][B] of the NHPA). "Such Indian Tribes shall be a consulting party" (36 CFR 800.2[c][2][B][ii]). Each of the Native American Tribes will be afforded an opportunity to participate in development of the draft PA and may be invited to participate as a concurring party. See Section 3.11.4.3 for a list of the Native American Tribes who have been invited to participate in development of the draft PA.

3.11.1.2 NRHP Criteria of Eligibility

Cultural resources are assessed for integrity and qualities that make the resources eligible for the NRHP, which provides for management and protection of these resources. There are three main standards that a cultural resource must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, the resource generally must be at least 50 years old. To meet the integrity criteria, the resources must possess the applicable aspects of integrity, which may include: location, design, setting, materials, workmanship, feeling, and association. Finally, the resource must be significant according to one or more of the following criteria:

- Criterion A – Be associated with events that have made a significant contribution to the broad patterns of history;
- Criterion B – Be associated with the lives of persons significant in history;
- Criterion C – Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D – Have yielded, or may be likely to yield, information important in prehistory or history.

Traditional Cultural Properties

If a cultural resource has been identified as having importance in traditional cultural practices and the continuing cultural identity of a community, it may be considered a traditional cultural property (TCP). The term "traditional cultural property" first came into use within the federal legal framework for historic preservation and cultural resource management in an attempt to categorize historic properties containing traditional cultural significance.

A TCP is defined as one that is eligible for the NRHP because of its association with cultural practices or beliefs of a living community that are: 1) rooted in that community's history and 2) important in maintaining the continuing cultural identity of the community (NPS 1998). To qualify for eligibility to the NRHP, a TCP must be more than 50 years old, must be a place with definable boundaries, must retain integrity, and must meet the criteria of eligibility as described above for cultural resources.

Examples of TCPs include:

- A rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents;
- An urban neighborhood that is the traditional home of a particular cultural group and reflects its beliefs and practices;
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining it historic identity; and
- A location associated with the traditional beliefs of a Native American Tribe about its origins, its cultural history, or the nature of the world (NPS 1998).

In addition to NRHP eligibility and TCP evaluation, places of cultural and religious importance to Native American Tribes also must be evaluated to determine if they should be considered under other federal laws or Executive Orders (EOs). These include, but are not limited to, the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA), and EO 13007 (Sacred Sites).

The NAGPRA established a means for Native Americans, including Indian Tribes, to request the return of human remains and funerary objects, sacred objects, or objects of cultural patrimony held by federal agencies or federally assisted museums or institutions. NAGPRA also contains provisions regarding the intentional excavation and removal of, inadvertent discovery of, and illegal trafficking in Native American human remains and sensitive cultural items.

The AIRFA established federal policy for protecting and preserving the inherent right of individual Native Americans to believe, express, and exercise their traditional religions including, but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

EO 13007 requires federal agencies, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions to: 1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and 2) avoid adversely affecting the physical integrity of such sacred sites. It also requires agencies to develop procedures for reasonable notification of proposed actions or land management policies that may restrict access to or ceremonial use of, or adversely affect, sacred sites. Sacred sites are defined in EO 13007 as "any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

Indian Trust Assets (ITAs) are legal interests in property held in trust by the U.S. for Native American Tribes or Native American individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of objects that may be trust assets are lands, minerals, hunting and fishing rights, and water rights. While most ITAs are on reservations, they also may be found off-reservations. The U.S. has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian Tribes or Indian individuals by treaties, statutes, and EOs. These sources of trust responsibility are sometimes further interpreted through court decisions and regulations.

3.11.2 Data Sources

In winter and spring 2011, a cultural resource files search was conducted to identify all previously conducted archaeological investigations and previously recorded cultural resources within the 2-mile transmission line corridor (SWCA 2011a,b,c,d). During the first phase of the files search, cultural data were collected online through the individual SHPOs. The second phase of the files search included visits to relevant BLM and USFS field offices to collect information on sites not available online. Bureau of Reclamation offices responsible for administering lands crossed by the Project also were contacted regarding cultural resources previously recorded within their jurisdiction. Additional information was collected through review of General Land Office (GLO) survey plats and historic maps. All of the collected cultural resources information was incorporated into four individual reports submitted to the BLM, Western, Bureau of Reclamation, USFS, and SHPOs. The information provided in the files search reports was used to prepare Section 3.1.1.4, Baseline Description.

3.11.3 Analysis Area

The baseline information was compiled from the cultural resources files search, which covered a 2-mile-wide corridor along each alternative. For the environmental consequences section, the analysis focuses on the 250-foot-wide transmission line ROW, which is where most of the potential impacts would occur. The 2-mile-wide files search area was used for the baseline section to provide the reader with an overall cultural context of the region crossed by the proposed Project.

3.11.4 Baseline Description

Based on the files search data, cultural resources in the files search area have been classified according to one or more site types (e.g., lithic scatter, open camp, structure). Complete information may not be readily available during the original recordation to determine the functional or cultural site type. Consequently, some sites may be re-categorized after additional research or survey. Sites fitting into more than one category usually are more complex and have more information potential than do single-category sites. At the broadest level, cultural resources are categorized as either prehistoric or historic.

3.11.4.1 Prehistoric Resources

Prehistoric sites in the files search area represent a wide range of human activities. Most of the sites are surface manifestations of hunter-gatherer campsites, which represent repeated occupations over thousands of years. Other sites are buried and contain intact, stratified cultural components. A broad range of activities, including lithic reduction, animal butchering, plant processing, heating/cooking, and lithic procurement, are represented at prehistoric sites previously documented in the files search area. Less common sites intersected by the Project corridors are rock shelters, conical wooden structures, rock art, bison kill sites, burials, stone circles, cairns, and house pits. These sites typically are considered important to Native Americans Tribes.

<u>Wyoming</u>

South-central Wyoming has been broadly defined as the Northwestern Plains prehistoric culture area. There are six periods of human occupation in the Northwestern Plains that span approximately

12,000 years: Paleoindian (ca.12,000-7,500 Before Present [B.P.]), Early Plains Archaic (ca. 7,500-5,000 B.P.), Middle Plains Archaic (ca. 5,000-3,000 B.P.), Late Plains Archaic (ca. 3,000-1,500 B.P.), Late Prehistoric (ca. 1,500-300 B.P.), and Protohistoric (ca. 300-150 B.P.). Of the previously documented prehistoric sites, one yielded a radiocarbon date of 8,840 B.P., which falls within the Paleoindian period. In addition, two sites (lithic scatter and open camp) have Paleoindian components.

Archaic and Late Prehistoric period sites are more common within the files search area than Paleoindian sites. A total of 77 are dated to the Archaic and 45 to the Late Prehistoric. Most of the Archaic and Late Prehistoric sites are surface lithic scatters or open camps with one or more features, although stone circles, cairns, and potential sites of tribal importance also are present.

Lastly, two of the previously recorded prehistoric sites yielded radiocarbon dates that fall within the Protohistoric period. The first is a large site containing dated components ranging in age from the Early Archaic to the Protohistoric. Excavations conducted at the site revealed dozens of Archaic-period pit features and intact activity areas. The second site contained fur trade items such as gun parts, horse tack, trade jewelry, glass beads, and metal points.

Colorado

The Northern Colorado River Basin was used by a variety of Native American Tribes, which began with the Clovis hunter gatherers at the end of the Pleistocene and continued to European occupation of the area. Regional prehistory of the area is divided into the Paleoindian era (ca. 13,500-8,400 B.P.), Archaic era (ca. 8,400-2,400 B.P.), Formative era (ca. 2,400-700 B.P., which includes the Fremont tradition [ca. 2,000-700 B.P.], and Protohistoric era (ca. 700-130 B.P.). Of the previously recorded prehistoric sites, four within the Northern Colorado River Basin have provided radiocarbon dates and diagnostic artifacts, including bone beds associated with Paleoindian projectile points indicative of temporary human occupation prior to 7,500 B.P.

A total of 31 Archaic period sites have been previously recorded within the files search area, the majority of which are open camps and open lithic sites. A large number of the Archaic period sites that have undergone test excavations have yielded radiocarbon dates as early as 5,000 B.P. Open camps and lithic scatters constitute the majority of the 24 Formative era sites previously recorded in the files search area. Of the Formative era sites, several yielded architectural remains (e.g., stone circles) and rock art. Most of the Fremont sites in northwestern Colorado consist of open and sheltered artifact scatters, open and sheltered architectural sites, and rock art.

A total of 4 Protohistoric sites have been previously documented in the files search area. The majority of the previously recorded Protohistoric sites are open camps and open lithic scatters. Documented Protohistoric components have been located at open architectural sites, sheltered camps, rock art sites, a burial, and a trail (Ute Trail/Meeker Massacre Trail).

Utah

In general, the prehistory of the area is divided into eight time periods, some of which have associated phases. These periods are: Paleoindian (ca. 11,000-8,000 B.P.), Early Archaic (ca. 8,000-5,000 B.P.), Middle Archaic (ca. 5,000-3,000 B.P.), Late Archaic (ca. 3,000-2,000 B.P.), Terminal Archaic (ca. 2,000-1,500 B.P.), Formative (ca. 1,500-800 B.P. including both the Fremont Complex [ca. 1,500-800 B.P.] and Virgin River Anasazi Complex [ca. 1,600-800 B.P.]), and Late Prehistoric (ca. 800-200 B.P. including the Protohistoric Phase [ca. 500-150 B.P.], during which there was an expansion of Numic-speaking peoples [Ute, Shoshone, Paiute] into the region from the Mojave Desert area).

As a result of the files search, only 14 previously recorded sites were identified that fall within the Paleoindian period. These sites are categorized as sparse lithic scatters with temporally diagnostic flaked stone tools. A total of 255 Archaic period sites have been previously recorded in the files search

area. Most of the sites consist of lithic scatters, open and sheltered campsites, and lithic quarries. Several of the sites contain large amounts of ground stone and small to large thermal features with fire-cracked rock, which become more prevalent in sites dating to the Late Archaic.

The majority of the 709 identified Formative period sites are artifact scatters. Of the 709 sites, 18 exhibit evidence of long-term habitation, some of which are located in caves and rockshelters. Other identified Formative period sites include lithic and ceramic scatters, villages, Fremont mounds, rock art, lithic scatters with pit house remains, and burials.

Only 94 sites identified during the files search are dated to the Late Prehistoric or Protohistoric periods. The majority of the sites are open campsites, caves, and shelters. Of the 94 sites, one is a prehistoric rockshelter that was identified as a TCP by a Ute spiritual leader. A number of TCPs have been documented within an area encompassing a creek and associated canyon. The area, which contains rock art and human occupation sites, was identified as a sacred site by Southern Paiute tribal representatives during an ethnographic study. Although none of the TCPs are located within the files search area, the creek would be intersected by one of the alternatives.

Nevada

Although commonly grouped within the Great Basin culture area, a number of major prehistoric and Native American culture areas overlap in southeastern Nevada. Particularly in the period postdating A.D. 500, various cultural influences are evident in the region, include the Ancestral Puebloan (Anasazi), Patayan, Fremont, and Numic traditions. For purposes of synthesizing prehistoric culture history, a variant of the terminology used by Fowler and Madsen (1986) is presented here. For the early periods, the Fowler and Madsen chronology works well; however, for the later periods, several subdivisions are provided to summarize the diversity represented by the archaeological record in the Las Vegas area. This chronology divides prehistory into a Paleoarchaic Period (ca. 11,200-7,000 B.P.); Archaic Period (ca. 7,000-1,500 B.P.); Formative Period (ca. 1,500-800 B.P.), including the Virgin Anasazi, Patayan, Fremont, and Numic traditions; Late Prehistoric Shoshonean or Numic Period (ca. 800-400 B.P. [A.D. 1200-1600]); and Protohistoric Period (A.D. 1600-1826).

Paleoarchaic sites are rare, with only six sites containing components dated to this period. The components consist of lithic scatters, isolated projectile points, and a rockshelter. A total of 63 Archaic period sites, including caves and rockshelters, habitation sites, subsistence/resource extraction sites, rock art sites, milling assemblages, and lithic or artifact scatters, have been previously recorded in the files search area.

Archaeological traditions present in southern Nevada during the Formative Period include the Ancestral Puebloan (Anasazi), Patayan, Fremont, and Numic. A branch of the Anasazi culture, called the “Virgin Anasazi,” occupied the Moapa Valley and Virgin River area northeast of the Las Vegas Valley. “Patayan” refers to groups located primarily south of the Las Vegas and Ivanpah valleys to the lower Colorado River drainage and incorporates groups previously called “Yuman.” The Fremont complex extended into eastern Nevada as far south and west as the Pahranagat Valley (Madsen and Simms 1998). Typically, the Numic tradition is associated with the immediate ancestors of the historic Paiute and Chemehuevi people of southern Nevada. A total of 79 sites dating to the Formative Period have been previously documented in the files search area. Rockshelters, ceramic scatters, artifact scatters, roasting pit sites, and habitation sites comprise the site types.

A total of 46 previously recorded sites are dated to the Shoshonean or Numic period, 41 with Numic tradition components and 5 are affiliated with the Patayan tradition. Site types consist of rockshelters, ceramic scatters, campsites and roasting pits, and lithic scatters. Only four sites, consisting of lithic and artifact scatters, date to the Protohistoric Period.

Notable prehistoric sites previously recorded within the files search area include an NRHP-listed TCP dating to the Middle to Late Archaic periods and the NRHP-eligible Panaca Summit Archaeological District. The District contains over 70 prehistoric sites, including residential bases, short-term campsites, activity loci, and isolates ranging in age from approximately 5,500 B.P. to the Protohistoric Period.

3.11.4.2 Historic Resources

Historic resources are districts, sites, buildings, structures, or other objects that are associated with or convey some aspect of history, architecture, engineering, and/or culture. Historic resources in the files search area could be eligible for the NRHP if they relate directly to national, state, regional, or local themes such as exploration, transportation, communication, mining, ranching and farming, urban development, or government and political activity. Historic sites can be significant under Criteria A, B, C, or D. Examples of historic resources previously identified in the files search area include, but are not limited to, railroad construction camps, railroad alignments, debris scatters, mining activities, roads, trails, structures, ranches, homesteads, rock art, and stone cairns.

Wyoming

Approximately 122 historic sites and 72 historic components have been previously documented in the Wyoming files search area. Common sites types include railroad construction camps, mining sites, highways and trails, debris scatters, railroad alignments, structures, and habitations. Most notable of the historic sites are the Cherokee Trail, Overland Trail, Lincoln Highway, Rawlins to Baggs Road, Rock Springs to Browns Park Road, Stockgrowers Bank/Dixon Town Hall, and the Red Rock.

The Cherokee Trail is most commonly known for its use by the Cherokee emigrants as an alternative route to the Oregon Trail, but it also served as a transportation route for freight, cattle, and passengers between Utah and Colorado to the Union Pacific Railroad in Wyoming. A segment of the Cherokee Trail eventually became known as the Overland Trail, which was heavily used by emigrants and prospectors largely as an alternative route to the Oregon Trail. In southern Wyoming, the Union Pacific Railroad generally followed the route of the Overland Trail and ultimately rendered the Oregon and Overland trails obsolete. All subsequent major transportation developments would parallel the Union Pacific Railroad route. One of the most notable is the Lincoln Highway, which was the first transcontinental automotive travel-way developed in the U.S. The Cherokee and Overland trails as well as the Lincoln Highway all are eligible for inclusion on the NRHP; however, not all of their segments contribute to the overall NRHP eligibility of these resources.

Throughout the late nineteenth century and continuing into the first decades of the twentieth century, the Rawlins to Baggs Road, known alternatively as the Rawlins to White River Agency Road, was a primary stage and mail route connecting the White River Ute Indian Agency in present-day Rio Blanco, Colorado, to the railhead at Rawlins. During the 1800s, the Rock Springs to Browns Park Road traveled through the Jesse Ewing Canyon taking travelers to the Browns Park area of Utah. Both of the roads are eligible for inclusion on the NRHP. The Stockgrowers Bank/Dixon Town Hall is a single-story ornamented block structure with a canted façade within the Dixon township plat. Lastly, the Red Rock is one of several landmarks located along the Overland Trail and contains inscribed names of people who traveled along the trail. Both the Stockgrowers Bank/Dixon Town Hall and Red Rock are listed on the NRHP.

Colorado

Approximately 257 historic sites and 33 historic components have been previously documented in the Colorado files search area. The most common site types are railroad construction camps, railroad alignments, habitations, trails/roads, debris scatters, highways, and transmission lines. Review of GLO maps indicates numerous named and unnamed roads and ranches, houses, railroads, trails, irrigation ditches, telephone lines, mining operations, pipelines, and fences. The majority of the roads, telephone

lines, irrigation ditches, ranches, and homesteads are near the towns of Craig and Hayden and most likely are associated with the original establishment of these towns as a result of the Union Pacific Railroad first crossing southern Wyoming around 1868 and the Denver and Salt Lake Railroad reaching Craig in 1913.

Notable previously recorded historic sites within the files search area include the Thornburg Wagon Road, Baggs to Craig Road, Victory Highway (U.S. 40), Road to Browns Park, Meeker to Bear River Road, and Road from Lily Park to Maybell. The Thornburg Road, which is eligible for the NRHP, was constructed between 1877 and 1906 and served as an important transportation route for freight wagons between Maybell, Colorado, and Baggs, Wyoming. From the late 1870s to the 1920s, the Baggs to Craig Road was a major transportation route between the Union Pacific Railroad in Wyoming and Colorado communities. In Moffat County, there are two segments of the road that are eligible for the NRHP. The Victory Highway, which was established following WWI as a memorial to those who fought and died in the war, ran from Kansas City to San Francisco and for the most part follows the path of U.S. 40. Although, the Road to Browns Park, Meeker to Bear River Road, and Road from Lily Park to Maybell are not eligible for the NRHP, they provided a connection between local communities or to larger communities outside of the Region.

Utah

Approximately 721 historic sites and 61 historic components have been previously documented in the Utah files search area. Common site types include debris scatters, railroads, roads, canals and ditches, homesteads, mining sites, and telegraph lines. Notable historic sites in the files search area include, but are not limited to, the Old Spanish Trail, Mountain Meadows Massacre Site, Soldier Creek Kilns (NRHP-listed), Aspen-Cloud Rock Shelters (NRHP-listed), Red Creek Canal, Dry Gulch Creek Bridge (Old 593), Durfey Farmstead, Sorensen's Country Store, Aurora LDS Meetinghouse, Nebeker Adelman House, Emery Town Site, Helper Town Site, Denver & Rio Grande Western Railroad, Old U.S. Highway 6 and 50, and Modena Elementary School (NRHP-listed).

The Old Spanish Trail is a NHT that was established in the early 1800s as a trade, transportation, and communication corridor between Santa Fe and Los Angeles. Multiple variants of the trail allowed travelers to take alternative routes or shortcuts based on the time of year, weather, size of the traveler's caravan, or the traveler's preference (see Section 3.15, Special Designation Areas, for additional information on the Old Spanish Trail). Other notable travel routes in the Project vicinity include the Rivera Expedition of 1765 and the Dominguez-Escalante expedition that crossed the Uintah Basin and continued through southwest Utah in 1776.

The Mountain Meadows Massacre site is a National Register District. Portions of the District recently attained status as a National Historic Landmark (NHL). The District is the location of the September 11, 1857, massacre of 120 Arkansas emigrants by Mormon militiamen. There are two separate parcels within the larger site, each a known location of a significant event associated with the massacre. One of the parcels includes the encampment, siege, and monument, as well as the militia approach and exit routes. It's possibly a Paiute Indian camp site. The second parcel includes the site of the massacre and gravesites.

Also included in the Utah files search area are the Rock Art ACEC, Nine Mile Canyon ACEC, and Browns Park SRMA. The Rock Art ACEC is a collection of rock art sites encompassed in a 5,300-acre area. These sites represent some of the best examples of prehistoric rock art in the Colorado Plateau. Protection of these sites is afforded by the ACEC status, but some designated areas also are protected under Mexican Mountain and San Rafael Reef's WSA. Nine Mile Canyon ACEC is known for its many petroglyphs and pictographs, many of which were created by the Fremont culture and Ute people. In addition to rock art, cultural sites such as granaries, ancient village sites, pit houses, rock shelters, settlers' cabins, and ranches also have been identified within the canyon. Browns Park SRMA is

significant because of its high value scenery, wildlife habitats, and cultural resources, including some of the earliest visible cultural sites associated with the Fremont culture (see Section 3.14, Land Use, and Section 3.15, Special Designation Areas, for an expanded discussion of the ACECs and SRMA).

Nevada

Approximately 221 historic sites and 18 historic components have been previously documented in the Nevada files search area. Some of the historic components are affiliated with Native American, Chinese/Oriental, or Euro-American cultures. Common site types are railroad construction camps, railroad alignments, debris scatters, mining sites, highways, transmission lines, structures, ditches, trails, and habitations. Notable historic sites are the Old Spanish Trail, 48 historic-built environment resources, and five NRHP-listed historic or archaeological districts. As stated previously, the Old Spanish Trail had multiple variants that broke off of the main trail allowing travelers to take alternative routes or shortcuts. In southern Nevada, one of the well-traveled variants or routes became known as the Mormon Road.

The 48 historic-built environmental resources are all within or immediately adjacent to Boulder City, Nevada. These resources consist of residential homes, the Boulder City Pumping Station, Old Airport Hangar, and Lake Mead NRA Maintenance Warehouse Complex.

Boulder City Historic District, Sloan Canyon Petroglyph Site, Tule Springs Archaeological Site, Tule Springs Ranch, and Las Vegas Wash Archaeological District constitute the five NRHP-listed historic or archaeological districts located within the files search area. The Boulder City Historic District is Nevada's largest listing on the NRHP with 408 buildings. Sloan Canyon Petroglyph Site contains more than 300 rock art panels with 1,700 individually designed elements created by native cultures from the Archaic to historic era. The Tule Springs Archaeological Site contained extinct mammoth, bison, horse, ground sloth, and camel dating to 28,000 years ago that were recovered during excavations conducted in the 1930s, 1950s, and 1960s. Inside Floyd Lamb State Park is Tule Springs Ranch, which served as a watering hole for Native Americans and prospectors traveling across Nevada in the 1800s. The Las Vegas Wash Archaeological District falls primarily within the Clark County Wetlands Park and contains over 30 prehistoric and historic sites.

Also included in the files search area are the Sloan Canyon National Conservation Area/Sloan Rock Art ACEC, Rainbow Gardens ACEC, proposed Shooting Gallery ACEC, and proposed Pahroc Rock Art ACEC. The Sloan Rock Art District, which is listed on the NRHP, is a 1,920-acre ACEC within the North McCullough Wilderness Area consisting of prehistoric habitation and rock art sites. Rainbow Gardens (36,412 acres) was designated as an ACEC because of its high geological, scientific, scenic, cultural, and sensitive plant values. The proposed Shooting Gallery ACEC is located in Lincoln County and is a multi-component cultural landscape consisting of a large complex of scattered rock art sites in association with several well-developed habitation areas. The Pahroc Rock Art site, located in Lincoln County, is proposed as an ACEC based on the prehistoric values in the form of archaeological rock art and rock shelter sites. (see Section 3.14, Land Use, and Section 3.15, Special Designation Areas, for an expanded discussion of the Sloan Canyon National Conservation Area and Rainbow Gardens ACEC).

3.11.4.3 Native American Consultation

It is the responsibility of all federal agencies to comply with the requirements of Section 106 of the NHPA and the ACHP regulations when planning and carrying out their undertakings. In doing so, they are required to consult with Native American Tribes depending on the specifics of the undertaking. Such consultation with Native American Tribes is central to the Section 106 process. Consultation is defined in the ACHP regulations as "the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process" [36 CFR § 800.16(f)]. Other consultation statutory requirements include:

- EO 13175, Consultation and Coordination with Indian Tribal Governments, 63 FR 96 (November 6, 2000). EO 13175 was issued to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications. When implementing such policies, agencies shall consult with tribal officials as to the need for federal standards and any alternatives that limit their scope or otherwise preserve the prerogatives and authority of Indian tribes.
- Government-to-Government Relations with Native American Tribal Governments (Memorandum signed by President Clinton, April 29, 1994), 59 Federal Register 22951 (May 4, 1994). The Memorandum directs federal agencies to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. Federal agencies must assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and assure that tribal government rights and concerns are considered during such development.

For purposes of Section 106 compliance, tribal consultation for the Project began when a certified letter was mailed on July 20, 2010, to all federally recognized Native American Tribes either residing in or with cultural ties to the files search area as depicted in **Table 3.11-1**. The letter initiated formal government-to-government consultation, informed the Tribes of the proposed undertaking, and solicited their concern/comments regarding possible historical and/or traditional ties to the area or the presence of properties of traditional religious and cultural importance. Included in the letters were a Project map, response form, and return address stamped envelope. The response form and return address envelope were enclosed with the letters as a means to inform the BLM and Western if any of the Tribes wished to participate in the consultation efforts or had any concerns associated with the Project.

Table 3.11-1 Initial Contact with Federally Recognized Native American Tribes, July 20, 2010

Eastern Shoshone Tribe of the Wind River Reservation	Winnemucca Indian Colony of Nevada
Northern Arapaho Tribe of the Wind River Reservation	Yerington Paiute Tribe of the Yerington Colony & Campbell Ranch
Southern Ute Indian Tribe of the Southern Ute Reservation	Yomba Shoshone Tribe of the Yomba Reservation
Ute Mountain Tribe of the Ute Mountain Reservation	Fort Mojave Indian Tribe
Confederated Tribes of the Goshute Reservation	Hopi Tribe of Arizona
Northwestern Band of Shoshone Nation	Kaibab Paiute Tribe
Paiute Indian Tribe of Utah	Navajo Nation
Skull Valley Band of Goshute Indians of Utah	San Juan Southern Paiute Tribe
Ute Indian Tribe of the Uintah and Ouray Reservation	Jicarilla Apache Tribe
Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho	Pueblo of Acoma
Duckwater Shoshone Tribe of the Duckwater Reservation	Pueblo of Cochiti
Ely Shoshone Tribe of Nevada	Pueblo of Isleta
Fort McDermitt Paiute-Shoshone Tribe of the Fort McDermitt Indian Reservation	Pueblo of Jemez
Las Vegas Tribe of Paiute Indians of the Las Vegas Indian Colony	Pueblo of Laguna
Lovelock Paiute Tribe of the Lovelock Indian Colony	Pueblo of Nambe
Moapa Band of Paiute Indians of the Moapa River Indian Reservation	Pueblo of Picuris
Paiute-Shoshone Tribe of the Fallon Reservation and Colony	Pueblo of Pojoaque
Pyramid Lake Paiute Tribe of the Pyramid Lake Reservation	Pueblo of San Felipe
Reno-Sparks Indian Colony	Pueblo of San Juan
Shoshone-Paiute Tribes of the Duck Valley Reservation	Pueblo of Santa Ana
Summit Lake Paiute Tribe of Nevada	Pueblo of Santo Domingo

Table 3.11-1 Initial Contact with Federally Recognized Native American Tribes, July 20, 2010

Te-Moak Tribe of Western Shoshone Indians of Nevada	Pueblo of Tesuque
Walker River Paiute Tribe of the Walker River Reservation	Pueblo of Zuni
Washoe Tribe of Nevada & California	Chemehuevi Indian Tribe

Seven of the Native American Tribes responded to the initial consultation letter dated July 20, 2011 (Confederated Tribes of the Goshute Reservation, Duckwater Shoshone Tribe of the Duckwater Reservation, Ely Shoshone Tribe of Nevada, Las Vegas Paiute Tribe, Paiute Indian Tribe of Utah, Pueblo of Laguna, and Pueblo of Santo Domingo). A tribal member of the Ely Shoshone Tribe of Nevada requested copies of the Project maps, which were provided via email. The Las Vegas Paiute Tribe and Pueblo of Santo Domingo indicated on the response form that they did not require consultation at this time; however, they may request other opportunities to consult with the BLM and Western in the future. In their response, the Pueblo of Laguna indicated that the Project would not have a significant impact, but requested an opportunity to review any newly discovered archaeological sites and that photographs be taken of the sites. Face-to-face meetings with the BLM and Western were requested by the remaining three tribes (Goshute, Duckwater Shoshone, and Paiute Tribe of Utah).

On December 1, 2010, the BLM and Western met with the Tribal Council of the Paiute Tribe of Utah during their scheduled council meeting to provide a presentation on the Project. A large format map showing the proposed route and alternatives was displayed during the presentation. Council members had questions regarding construction of the transmission line and asked if there was a Project website where they could find additional Project information; the BLM provided the Council members with the website. At the end of the meeting, the Council provided the BLM and Western with the appropriate tribal contact for any future correspondence. To date, no other meetings have been held with the Paiute Tribe of Utah.

The BLM and Western met with the Duckwater Shoshone and Ely Shoshone tribes in Ely, Nevada, on January 12, 2011, to present an overview of the Project. At the start of the meeting, the Tribal chair stated that the meeting was an informational meeting and not considered government-to-government consultation because not all of the Tribal council was present. The tribes had questions regarding the status of the cultural resources investigations and selection of the cultural contractor. Railroad Valley was mentioned as an area of concern by several tribal members. At the end of the meeting, the Tribes requested large-scale maps of the Project where it would cross or be close to their tribal lands. Following the meeting, the BLM delivered the maps to the tribes. To date, no other meetings have been held with the Duckwater Shoshone and Ely Shoshone tribes.

On January 19, 2011, the BLM telephoned the Confederated Tribe of the Goshute Reservation to discuss their request for a face-to-face meeting. During the call, the BLM provided additional information on the Project, in particular, the location of the proposed transmission lines. Since the proposed location of the transmission line would not be within Goshute Tribal lands, the tribal Administrator indicated there was no need for additional information or a face-to-face meeting.

In late September 2011, a second set of letters was sent to the Native American Tribes listed on **Table 3.11-1** inviting them to participate in development of the draft PA. The letters included details of the Project, a description of historic properties identified through the files search, and information on an upcoming meeting on October 18, 2011, in Salt Lake City, Utah, to discuss the PA process. Enclosed with the letters was a Project map and a flyer with specific information regarding the date, time, and location of the meeting in Salt Lake City. Only the Hopi Tribe responded to the second letter. The Hopi are interested in ongoing consultation on the Project and requested copies of the cultural resources

inventory report and any proposed treatment plans for review and comment. In addition, the Hopi requested an ethnographic overview of the Project area.

Follow-up calls to all of the Native American Tribes were conducted after the second set of letters to verify receipt of the letters and to ask if a tribal representative would be attending the October 18 PA meeting in Salt Lake City. None of the Tribes attended the October 18 meeting in Salt Lake City.

On December 21, 2011, and January 4, 2012, letters were sent to the Native American Tribes listed in **Table 3.11-1** inviting them to attend the Rapid Response Transmission Team (RRTT) meetings held on:

- January 9, 2012, in Cheyenne, Wyoming;
- January 10, 2012, in Denver, Colorado;
- January 11, 2012, in Las Vegas, Nevada; and
- January 12, 2012, in Salt Lake City, Utah.

The BLM and Western, on behalf of the RRTT, held these meetings to help the RRTT better understand the Project as the RRTT worked to expedite and improve the federal government's evaluation of transmission line applications. Representatives from the RRTT who attended the meetings included the BLM Deputy Chief of Staff, Department of Energy-Renewable Energy Senior Advisor, Department of the Interior Special Assistant to the Counselor, and BLM Rights-of-Way Branch Chief. A conference line (call-in number) was provided to those who were unable to attend the meetings in person. None of the invited Native American Tribes attended the meetings.

On April 19, 2012, the BLM and Western held an online conference call to discuss the status of the draft PA. The consulting parties listed in Section 3.11.1.1 and the Native American Tribes listed in **Table 3.11-1** were invited to participate on the conference call. None of the invited Native American Tribes participated on the call.

At the request of the Ute Tribal Council, the BLM and Western attended a Ute Tribal Council Meeting on May 31, 2012, and met with the Ute Mountain Ute Tribe, Southern Ute Tribe, and Ute Indian Tribe of the Uintah and Ouray Reservation to discuss the Project. The BLM and Western gave a presentation of the Project and answered questions from the Tribes. In general, the questions focused on Project components, tribal consultation, BIA responsibilities, and ROWs on tribal lands. The Ute Mountain Ute were concerned about Project impacts to human remains, cultural landscapes, TCPs, and sacred sites.

Western and the BLM attended another Ute Tribal Council meeting on August 28, 2012. During this meeting, detailed Project maps of the 2-mile transmission line corridors, a Project description, and a schedule for completion of the draft EIS were presented to the Council members. As requested by the Council, Western and the BLM also met with the Ute Tribe's Energy and Minerals Department. Project information, a Project map, and contact information were left with the Council members and the Energy and Minerals Department. To date, no other meetings have been held with the Ute Tribal Council.

On November 8, 2012, the BLM and Western held an online conference call to discuss the status of the draft PA. The consulting parties listed in Section 3.11.1.1 and the Native American Tribes listed in **Table 3.11-1** were invited to participate on the conference call. None of the invited Native American Tribes participated on the call.

On November 26, 2012, the BLM and Western sent letters to five additional pueblos as part of the consultation process. The five pueblos included the Pueblo of San Ildefonso, Pueblo of Santa Clara, Pueblo of Sandia, Pueblo of Taos, and Pueblo of Zia. Included in the letters were a Project map, response form, and return address stamped envelope. The letters included information on the Project,

APE, PA process, and historic properties identified as a result of the files search. None of the contacted pueblos responded to the letters.

To date, no places of traditional religious and cultural importance to the contacted Native American Tribes have been identified in or near the files search area through the government-to-government consultation efforts. Concerns expressed by the Tribes have been with human remains, TCPs, cultural landscapes, and sacred sites. Opportunities for the identification of locations of possible traditional religious and cultural importance that may be affected by the Project, as well as opportunities for the Tribes to express their concerns would remain open throughout the consultation process, which currently is ongoing and would continue through construction.

3.11.5 Regional Summary

Tables 3.11-2 and **3.11-3** summarize the cultural types and eligibility status by region and state of those sites identified through the files search, GLO review, visits to the BLM and USFS field offices, and contacts with the Bureau of Reclamation. **Table 3.11-2** summarizes the findings for those sites located within the 2-mile-wide files search area; whereas, **Table 3.11-3** summarizes the findings for those sites located within the 250-foot-wide transmission line ROW.

Table 3.11-2 Site Types and NRHP Status by Region and State within the Files Search Area (2-mile Transmission Line Corridor)

Site Types and NRHP Status by Region and State - 2-Mile Corridor									
	Summary of Site Types					Summary of NRHP Status			
State	Prehistoric Sites	Historic Sites	Multi-component Sites	Potential TCPs[1,2]	No Information	Listed	Eligible for Listing	Not Eligible	Unevaluated
Region I									
Wyoming	1,455	122	145	14	91	2	447	858	506
Colorado	408	44	26	7	5	0	59	321	103
Region II									
Colorado	693	213	41	49	27	2	73	693	206
Utah	1,417	694	104	144	53	2	788	1,062	416
Region III									
Utah	530	27	18	27	22	0	284	235	78
Nevada	763	103	20	188	122	0	150	563	295
Region IV									
Nevada	231	118	17	117	11	7	88	205	77

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] All of the potential TCPs are also prehistoric sites. As such, they are counted twice in the site totals.

Sources: SWCA 2012a-e, 2011a-d.

Table 3.11-3 Site Types and NRHP Status by Region and State within the 250-foot Transmission Line ROW

Site Types and NRHP Status by Region and State – 250-foot ROW									
	Summary of Site Types					Summary of NRHP Status			
State	Prehistoric Sites	Historic Sites	Multi-component Sites	Potential TCPs[1,2]	No Information	Listed	Eligible for Listing	Not Eligible	Unevaluated
Region I									
Wyoming	124	33	36	0	27	0	86	83	51
Colorado	48	5	5	12	0	0	20	34	4
Region II									
Colorado	60	38	6	12	4	2	34	42	30
Utah	116	152	17	16	13	0	144	135	19
Region III									
Utah	81	19	4	2	8	0	72	28	12
Nevada	63	23	2	19	12	1	25	42	32
Region IV									
Nevada	27	60	1	23	1	2	41	29	17

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] All of the potential TCPs are also prehistoric sites. As such, they are counted twice in the sites totals.

Sources: SWCA 2012a-e, 2011a-d.

3.11.6 Impacts to Historic Properties and Sites of Native American Concern

The impact files search area for historic properties and Native American concerns is the APE. Under Section 106 of the NHPA, the APE is defined as "those areas in which impacts are planned or are likely to occur. Specifically, the APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. Additionally, the APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16[d])."

Per the draft PA and for purposes of this EIS, the APE for direct effects is the area within which historic properties may sustain physical alteration or destruction as a result of the Project. The APE for direct effects is limited to the area of potential ground disturbance by activities related to the Project that may directly cause alterations in the character or use of historic properties.

The APE, as currently defined, encompasses an area sufficient to accommodate all of the Project components under consideration. The APE may be modified when tribal consultation, additional field research or literature review, consultation with consulting parties, or other factors indicate that the qualities and values of historic properties that lie outside the boundaries of the currently defined APE may be affected directly, indirectly, or cumulatively.

If the BLM determines that the Project or changes to the Project may cause unforeseen direct, indirect, or cumulative effects to historic properties beyond the extent of the established APE, then the BLM may use the process set forth in the PA to determine whether to modify the APE.

The APE for indirect effects on historic properties considers visual, audible, and atmospheric elements that could diminish the integrity of properties for which setting, feeling, and/or association are qualifying characteristics of NRHP eligibility. The indirect APE for the Project extends for five miles on either side of the transmission line centerline or to the visual horizon, whichever is closer. Where the indirect APE includes TCPs, NHLs, NHTs, or other classes of historic properties for which setting contributes to eligibility, additional analyses may be required and the indirect APE may need to be modified accordingly, as it may extend beyond the five-mile convention when effects have been determined to extend beyond this distance.

Cumulative effects include reasonably foreseeable effects caused by the Project that may occur later in time, be farther removed in distance or be cumulative [(36 C.F.R. part 800.5(a)(1)]. For purposes of this EIS and per the draft PA, the APE for cumulative effects is the same as described for direct and indirect effects.

Impacts to historic properties, including TCPs and properties of traditional religious and cultural importance to Native Americans, were evaluated for each alternative using the following methods:

- The analysis of potential direct and indirect impacts was based on review of existing files and information obtained from the Wyoming, Colorado, Utah, and Nevada SHPOs, BLM, USFS, and Bureau of Reclamation, and by review of GLO maps.
- Potential effects were quantified where possible. Where quantitative data are unavailable, best professional judgment or qualitative assessments were used to describe impacts.

To date, no Class III pedestrian inventories have been conducted for the Project. Once the final route has been selected and the ROD has been issued, an intensive Class III inventory of previously uninventoried areas would be conducted to identify historic properties in the APE. A combination of inventory and consultation would be used to determine the presence of historic properties within the APE. In recognition of their particular expertise, Native American Tribes and their designated representatives would be consulted to establish the locations and significance of properties of traditional religious and cultural importance to the Tribes. The BLM would be responsible for reviewing the results of the inventories, determine NRHP eligibility, assess effects, and seek resolution of adverse effects in consultation with Western, the SHPOs, USFS, Bureau of Reclamation, NPS, USFWS, Native American Tribes, and other consulting parties.

In addition to the pedestrian inventory, an in-depth visual analysis along the final route would be conducted to accurately identify whether any historic properties, including properties of traditional religious and cultural importance in which setting contributes to their eligibility, would be visually impacted by the Project. In addition to properties of traditional religious and cultural importance, sacred sites or other sensitive sites identified by Native Americans during consultation also may require visual analysis. The analysis would include on-the-ground verification of historic property/tribal site locations, as well as verification of Project visibility from the historic property or site. In some instances it may be necessary to set up a Key Observation Point (KOP) at the location of the historic property or site to observe and analyze the visibility of aboveground Project facilities during different times of day and during different weather conditions (e.g., cloudy versus sunny skies). Results of the analysis would be used to determine the magnitude of visual effects to the setting of historic properties or sites from which aboveground Project facilities are visible.

Although no Class III inventories or in-depth visual analyses have been conducted to date for the Project, the EIS analysis of impacts to the Old Spanish Trail, which is a congressionally designated NHT, was supplemented with data obtained from the National Historic Trails Inventory (AECOM 2012). The inventory was not conducted for the Project, but was a separate endeavor conducted by the BLM using Recover Act funding and staff resources to develop and apply new inventory and management

tools that include consistent standards for trail resource documentation, protection, use, and preservation. BLM's National Trails Inventory was a significant undertaking to document national historic trail settings, record trail attributes and resources, create trail information archives, and manage trail data. The inventory's goal was to: 1) understand the resources associated with each trail, which meant determining where the route lies in some instances; 2) determine where physical traces or archaeological resources are present; and, 3) evaluate settings where trail segments are located and identify those locations where historic integrity and scenic quality have been maintained. A total of six NHTs across the western U.S. were investigated as part of the inventory. Of these six trails, only the Old Spanish Trail is located within the impacts analysis area. The Cherokee and Overland trails, which also are located in the impacts analysis area, currently are being evaluated for inclusion in the NHT system.

In general, primary issues identified by federal and state agencies during previous NEPA transmission line analyses that are related to the Project include:

- Construction of the transmission line and associated facilities could adversely affect historic properties such as prehistoric or historic archaeological sites, districts, buildings, structures, roads and trails, and objects.
- Previously undiscovered cultural resources, including burials and associated funerary objects, could be discovered and adversely affected during ground-disturbing activities associated with construction.
- Unauthorized artifact collection and/or vandalism.
- Introduction of visual or auditory elements that diminish the integrity of a historic property's setting.

Issues identified at the public scoping meetings included:

- Potential impacts to the Mountain Meadows Massacre site and Mountain Meadows NHL.
- Potential impacts to the Old Spanish Trail and Overland and Cherokee trails.
- Potential impacts to the archaeological resources within the Adobe Town WSA.

For purposes of this EIS, impacts are considered significant if management actions result in adverse effects to the qualities that make a property eligible for inclusion in the NRHP or considered important to Native American Tribes as measured by:

- Physical destruction or alteration of a property or relocation from its historic location;
- Isolation or restriction of access;
- Change in the character of the property's use or of physical features within the property's setting, or the introduction of visible, audible, or atmospheric elements that are out of character with the significant historic features of the property;
- Neglect that leads to deterioration or vandalism; and
- Transfer, sale, or lease from federal to non-federal control, without adequate and legally enforceable restrictions or conditions to ensure the preservation of the historic significance of the property.

3.11.6.1 Impacts from Terminal Construction and Operation

Northern Terminal

Construction of the Northern Terminal would result in 504 acres of ground disturbance. Surface disturbance activities associated with the terminal would include pre-development geotechnical sample drilling and site development, which would involve vegetation clearing, grading, and facility construction. Construction-associated surface disturbance would include land cleared for storage areas, a concrete batch plant site, temporary work areas, and pulling, tensioning, and splicing sites. Operation surface disturbance would include footprints of the access roads, the footprints of the station facilities, and installation of the perimeter fence. The types of direct, indirect, and visual impacts to historic properties that could occur during construction and operation of the terminal would be the same as discussed in Section 3.11.6.2, Impacts Common to Alternative Routes and Associated Components.

No previously recorded cultural resources were identified within the proposed location of the Northern Terminal. Prior to construction, a Class III pedestrian inventory would be conducted for the proposed location of the terminal. If historic properties, including TCPs and properties of traditional religious and cultural importance are identified within proposed disturbance areas and would be adversely affected, the property would be avoided through Project redesign. However, if avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the draft PA and through implementation of design features. Any previously unknown cultural resources (other than isolates) discovered during construction and operation activities would be handled as detailed in the draft PA (see Section 3.11.6.2 for additional details regarding the draft PA).

Summary: Unavoidable adverse effects to historic properties that may be located within the disturbance area of the Northern Terminal would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as stipulated in the PA. As such, no adverse effects to known and unknown historic properties would be anticipated as a result of constructing and operating the Northern Terminal.

Southern Terminal

Construction of the Southern Terminal would result in 412 acres of ground disturbance. Surface disturbance activities and site clearing associated with the Southern Terminal would be identical to those associated with the Northern Terminal. Potential direct, indirect, and visual impacts to historic properties as a result of constructing and operating the Southern Terminal would be the same as described in Section 3.11.6.2, Impacts Common to All Alternatives and Project Components.

As a result of the files search, only one previously recorded isolated artifact was identified within the proposed location of the Southern Terminal. As described for the Northern Terminal, a Class III inventory would be conducted prior to construction. If historic properties are identified as a result of the inventory, the properties would be avoided. If avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the draft PA and through implementation of design features.

Summary: Unavoidable adverse effects to historic properties that may be located within the disturbance area of the Southern Terminal would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as stipulated in the PA. As such, no adverse effects to known and unknown historic properties would be anticipated as a result of constructing and operating the Southern Terminal.

Design Option 2

The impacts of constructing and operating Design Option 2 would be similar to those discussed under the alternative routes because the implementation of this design would utilize the same alternative

routes and construction techniques. Differences between this design option and the Project include the locations of the southern converter station and ground electrode system as well as the addition of a series compensation station midway between the IPP and Marketplace. The southern converter station would be located near the IPP in Utah instead of at the Marketplace in Nevada and the ground electrode system would be within 50 miles of the IPP. Potential adverse effects to known and unknown historic properties would be the same as described in 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. The same design features and stipulations outlined in the draft PA would be implemented to minimize or mitigate potential adverse effects to known and unknown historic properties associated with Design Option 2.

Design Option 3

Implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the Project; therefore, impacts from construction and operation of this design option would be the similar to those discussed under the alternative routes. Differences between this design option and the Project include the construction of an interim substation and connection at IPP and a series compensation station midway between Sinclair, Wyoming and IPP. These would operate during Phase I of the design option as described in Chapter 2.0. The series compensation station would be located adjacent to the transmission line; therefore impacts are disclosed within the description of the Project routes. Potential adverse effects to known and unknown historic properties would be the same as described in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. The same design features and stipulations outlined in the draft PA would be implemented to minimize or mitigate impacts to known and unknown historic properties associated with Design Option 3.

3.11.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

Ground-disturbing activities, such as installation of the transmission line foundations and anchors; construction of new access roads and upgrade of existing access roads; construction of electrical substations and other ancillary facilities; and, use of temporary work areas and staging areas for storing equipment and supplies would have the potential to directly impact historic properties, including TCPs and properties of traditional religious and cultural importance to Native American Tribes. These physical impacts could occur to both known sites and subsurface sites and could result in the vertical and horizontal displacement of soil containing cultural materials, damage to or destruction of artifacts and features, and loss of archaeological data.

Other potential effects associated with the Project could include off-road vehicle traffic associated with construction and erosion due to construction activities, soil compaction, or vegetation removal. In addition, vandalism, inadvertent damage, or illegal artifact collection could occur as a result of increased access via newly constructed roads and numbers of construction personnel working within and adjacent to the 250-foot-wide transmission line ROW. New road construction would make sites more accessible and studies have shown most site vandalism happens near roads. The presence of more people in the construction zone may lead to artifact collection during work breaks or after hours.

Visual impacts to historic properties (as well as cultural /historic landscapes) where setting is an aspect of integrity could occur as a result of introducing visual elements out of character with a property located within the visual APE. Introduction of structures such as the proposed transmission line and associated towers into an otherwise rural or natural setting could diminish the integrity of a property's features that contribute to its significance. Assessment of effects (including visual effects) on historic properties is based in part on the evaluation of integrity. According to the NRHP guidelines, integrity is defined as the ability of an historic property to convey its own significance; evaluations of integrity must always be grounded in an understanding of a property's physical features and whether they remain sufficiently

intact to convey its significance. A historic property's integrity includes seven unique aspects: location, setting, design, materials, feeling, workmanship, and association. Based on these aspects, the types of sites considered visually sensitive include, but are not limited to, National Historic Monuments, Districts, Landmarks, and Trails; sites eligible under criteria A, B, or C; and TCPs.

During public scoping, concerns were expressed regarding possible direct and visual impacts to the Cherokee and Overland trails, Old Spanish Trail, Mountain Meadows Massacre Site and Mountain Meadows NHL, and Adobe Town WSA. The Cherokee and Overland trails would be crossed by the alternatives in Wyoming; whereas, the Old Spanish Trail would be crossed by the alternatives in Utah and Nevada. In Wyoming, there are two routes of the Cherokee Trail, a northern route and a southern route. The northern route has been erased and no visible remnants remain; therefore, the EIS analysis focuses on the southern route. It should be noted that the NPS guidelines disqualify cultural sites listed under the NRHP when their physical features are no longer visible (NPS 2002). Although none of the alternatives cross the Mountain Meadows Massacre Site and Mountain Meadows NHL, there were concerns about visual effects to the site and possible disturbance to unmarked graves that may be located outside of the site's boundary. The Adobe Town WSA is located more than 6 miles from the alternatives; therefore, no impacts to historic properties located in the WSA would be anticipated.

The potential for the discovery of unanticipated historic properties during construction activities exists within proposed disturbance areas and could result in an adverse effect. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the discovered cultural material. Displacement of cultural material affects the potential to understand the context of the property and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Potential impacts to unanticipated discoveries could be greater than impacts to properties previously identified because damage to unanticipated discoveries occurs prior to their recordation and evaluation, thereby complicating mitigation procedures.

Resolution of Construction Impacts

To date, the number of historic properties that would be adversely affected by the Project is unknown. As stipulated in the draft PA, an intensive Class III pedestrian inventory would be required after the final route is selected by the BLM and Western. The pedestrian inventory of the final route would be completed prior to construction and with enough lead time to allow for NRHP evaluation of identified sites, impact assessments, and resolution of adverse effects, if necessary. The inventory would be performed regardless of land ownership. All cultural resources located within the APE would be evaluated for eligibility to the NRHP and for Native American traditional religious and cultural importance in consultation with Native American Tribes.

Per the draft PA, the BLM Wyoming State Office is lead for compliance with Section 106 of the NHPA on behalf of the federal agencies (36 CFR 800.2(a)(2)), as evidenced by the Memorandum of Understanding between BLM and Western. In consultation with Western, the four SHPOs (Wyoming, Colorado, Utah, and Nevada), USFS, Bureau of Reclamation, Native American Tribes, and other consulting parties, the BLM would determine whether construction and operation of the Project would have an adverse effect on any historic properties, including TCPs and properties of traditional religious and cultural importance to Native American Tribes. If the BLM determines that a property would be adversely affected, mitigation would be proposed to minimize or mitigate those effects in accordance with the PA. Mitigation to minimize or mitigate adverse effects may include, but would not be limited to, one or more of the following measures:

- Data recovery, which might include the systematic professional excavation of a historic property;
- Use of landscaping or other techniques that would minimize or eliminate visual effects to a property's setting;

- Development of interpretive materials (e.g., historic markers, exhibits, interpretive brochures, or publications);
- Historic American Buildings Survey/Historic American Engineering Record or other agreed upon historic recordation process; or
- Other mitigation determined by the BLM through consultation with Western, the SHPOs, USFS, Bureau of Reclamation, Native American Tribes, and other consulting parties.

Mitigation measures would be based on the types of impacts relevant to the site type and to the scope and nature of the impact. Per the draft PA, unavoidable adverse effects to historic properties, including TCPs and properties of traditional religious and cultural importance, would be minimized or mitigated through implementation of a historic properties treatment plan (HPTP). The HPTP would address the property adversely affected and set forth means to minimize or mitigate the Project's effects. A detailed description of treatment proposed for historic properties, including TCPs and properties of traditional religious and cultural importance, as well as the rationale would be provided in the plan. Proposed treatment also would take into account visual and auditory effects to a property's setting where those aspects of integrity help convey its significance. If data recovery is the preferred treatment option for a site, then the BLM would ensure that the developed treatment is based on an appropriate research design and is reviewed and approved by Western, the SHPOs, USFS, Bureau of Reclamation, Native American Tribes, and other consulting parties.

Visual impacts to historic properties where setting contributes to their NRHP eligibility and from which the Project would be visible would be determined through viewshed analysis, on-site inspection, and photo inspection. The analysis also may be conducted for sites identified by tribal representatives as those sites in which visual impacts could occur. The viewshed analysis would be used to determine which physical feature of the Project would be visible from a property for which setting is an important aspect of integrity. Non-specular conductors and shield/ground wires would be used as a design feature to reduce potential visual effects (see applicant-committed design features in **Appendix C**, **Table C-2**). Adverse effects to the integrity of a property's setting would be minimized or mitigated as stipulated in the draft PA and HPTP.

Based on the proposed surface water control system and implementation of erosion control measures, potential effects to historic properties located within and outside of the APE as a result of drainage or soil erosion are anticipated to be minor (see design features in **Appendix C**, **Table C-2**).

To minimize the potential for illegal collection, vandalism, and inadvertent damage associated with increases in the number of construction personnel in the construction zone, Project personnel would be instructed on the federal, state, and tribal laws that protect historic properties, including prohibition of collection and removal of cultural material (see applicant-committed design features in **Appendix C**, **Table C-2**). To minimize impacts associated with off-road vehicles, construction and maintenance traffic outside of the ROW normally would be restricted to pre-designated access or public roads as stipulated in the applicant-committed design features (**Appendix C, Table C-2**).

As provided in the PA, if any previously unknown archaeological sites are discovered during construction, all construction activities would cease in the area of the discovery, and the BLM or applicable land management agency would be notified of the find. The BLM would implement an Inadvertent Discovery Plan, which would be developed prior to issuance of a Notice to Proceed. The plan would be included as an appendix to the HPTP.

Per the PA, Native American human remains, funerary objects, and items of cultural patrimony encountered on federal land during construction would be handled according to the provisions of the NAGPRA and its implementing regulations (43 CFR §10). Construction would not resume in the area of the discovery until the BLM or applicable land management agency has issued a Notice to Proceed.

Native American human remains and associated grave offerings found on state or private land would be handled in accordance with applicable state law. Non-Native American human remains found on federal, state, or private land would be treated in accordance with applicable state laws.

Summary: As previously stated, once the final route has been selected by the agencies, an intensive Class III inventory and viewshed analysis would be conducted to identify historic properties within the direct, indirect, and visual APEs and determination of adverse effects to those properties would occur. Until that time, it is unknown how many historic properties would be adversely affected by the Project. Currently, a PA is being developed for the Project. Unavoidable adverse effects to historic properties, including TCPs and properties of traditional religious and cultural importance as a result of construction would be minimized or mitigated as stipulated in the PA, and through implementation of the HPTP and design features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.

Information obtained from the National Historic Trails Inventory was used to assess impacts to the Old Spanish Trail, which is a congressionally designated NHT. Many segments of the Old Spanish Trail would be crossed by alternatives in Utah and Nevada; several of those segments are categorized as NHT 1 (verified, evident, and unaltered). Additionally, some of the alternatives in Utah and Nevada would be visible from segments of the trail that are categorized as NHT 1 for several miles. Those segments crossed by the alternatives or from which the alternatives would be visible are identified later in this section under the comparison of alternatives for each region. Depending on which alternative is chosen as the final route, direct and visual impacts to the Old Spanish Trail could occur as a result of the Project. If direct and/or visual impacts to the Old Spanish Trail would occur, the impacts would be minimized or mitigated as stipulated in the PA and HPTP as well as through implementation of the applicant-committed design features (**Appendix C, Table C-2**).

Operation Impacts

Direct adverse effects to historic properties, including TCPs and properties of traditional religious and cultural importance to Native American Tribes, would be minimized or mitigated as stipulated in the PA and HPTP prior to construction. In some instances, impacts to these properties would be avoided by spanning the property. Although spanning the property would eliminate direct effects, the property itself would be left in place and at risk of inadvertent damage, illegal collecting of artifacts, and/or vandalism during routine maintenance or if emergency maintenance is required. To minimize the potential for illegal collection, vandalism, and inadvertent damage, Project personnel would be instructed on the federal, state, and tribal laws that protect historic properties, including prohibition of collection and removal of cultural material, as stipulated in the applicant-committed design features (**Appendix C**, **Table C-2**).

Summary: The design feature prohibiting collection or removal of cultural material would reduce the incidence of vandalism or illegal collection of artifacts by Project personnel. However, these types of impacts may still occur as a result of increased public access to previously inaccessible areas.

Decommissioning Impacts

Decommissioning impacts to historic properties, including TCPs and properties of traditional religious and cultural importance would be similar to those described for operation impacts. There would be a beneficial effect to historic properties located in the viewshed of the Project as the transmission line structures are removed from view.

Summary: The design feature prohibiting collection or removal of cultural material would reduce the incidence of vandalism, inadvertent damage, and/or illegal collection of artifacts by Project personnel during activities associated with decommission. Visual impacts to historic properties and cultural landscapes would be reduced.

3.11.6.3 Region I

Construction, operation, and decommissioning impacts in Region I and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. It should be noted that the site totals provided in the site summary tables are based on databases of previously recorded sites documented during field inventories conducted for other projects that fall within the files search area. As such, if areas along an alternative have been previously inventoried, site totals most likely will be high; however, there are occasions when a small number of sites or no sites are located during field inventories. Conversely, if no or limited field inventories have been previously conducted along an alternative, site totals will be low or zero. Given this bias, the site totals may not be indicative of actual site occurrence, but do provide a baseline for the impact analysis.

Table 3.11-4 provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail/road crossings, visibility of the alternative from the historic trail/road, inventory coverage, site density, disturbance acreage, and miles of transmission line and access roads associated with each alternative route in Region I. The site information is based on the files search data.

Table 3.11-4 Summary of Region I Alternative Route Impacts

Parameter		Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Site Types	Prehistoric	33	25	22	38
	Historic	4	8	11	6
	Multi-component	8	8	5	9
	Potential TCPs[1]	0	1	0	1
	No information	7	7	7	6
Site Totals[2]		52	49	45	60
Historic Trails/Roads Crossed and Visibility	Cherokee Trail	1 contributing segment crossed; visibility of the alternative – 24 miles	1 contributing segment crossed; visibility of the alternative – 9 miles	1 contributing segment crossed; visibility of the alternative – 11 miles	3 non-contributing segments crossed; visibility of the alternative – 28 miles
	Overland Trail	1 contributing segment crossed; visibility of the alternative – 9 miles	1 contributing segment crossed; visibility of the alternative – 9.7 miles	1 contributing segment crossed; visibility of the alternative – 7 miles	1 contributing segment crossed; visibility of the alternative – 9.2 miles
	Lincoln Highway	No segments crossed; visibility of the alternative – 50 miles	No segments crossed; visibility of the alternative – 55 miles	No segments crossed; visibility of the alternative – 48 miles	No segments crossed; visibility of the alternative – 50 miles
	Rawlins to Baggs Road	1 segment crossed (unknown if contributing); visibility of the alternative – 9 miles	1 segment crossed (unknown if contributing); visibility of the alternative – 9 miles	3 segments crossed (1 contributing; 2 unknown if contributing); visibility of the alternative – 33 miles	1 segment crossed (unknown if contributing); visibility of the alternative – 13.5 miles
Average Percent Inventory Coverage		14 percent	9 percent	9 percent	35 percent
Average Site Density[3]		3 sites per 100 acres inventoried	5 sites per 100 acres inventoried	4 sites per 100 acres inventoried	4.7 sites per 100 acres inventoried
Initial Disturbance[4]		2,057 acres	2,083 acres	2,511 acres	2,306 acres
Miles of Transmission Line and Access		155 miles; 227 miles	159 miles; 223 miles	186 miles; 269 miles	171 miles; 242 miles

Table 3.11-4 Summary of Region I Alternative Route Impacts

Parameter		Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Roads					
NRHP Status[5]	Listed	0	0	0	0
	Eligible for Listing	19	19	24	19
	Not Eligible	24	21	7	29
	Unevaluated	9	8	14	11

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Source: SWCA 2012a,b, 2011a,b.

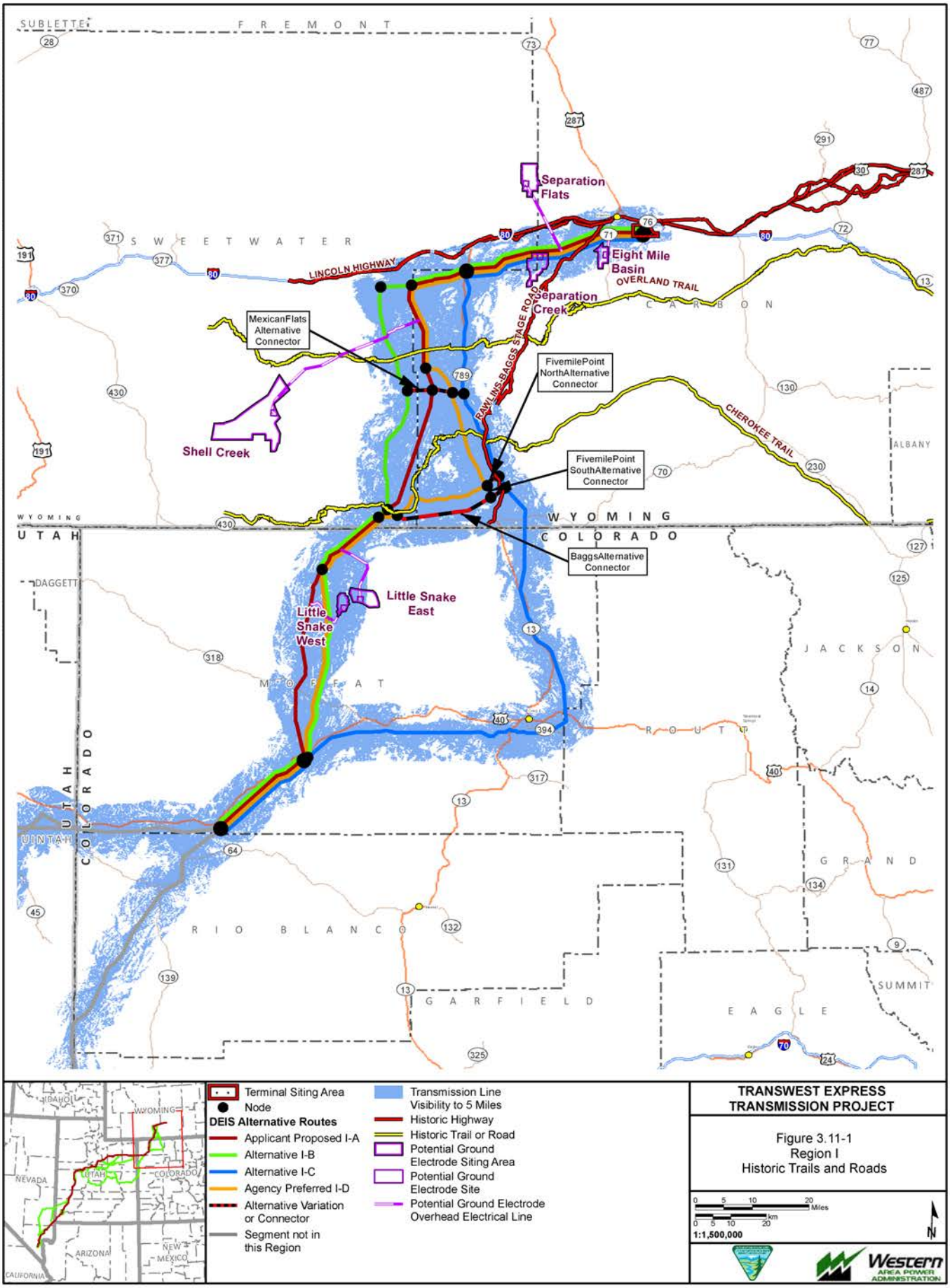
Alternative I-A (Applicant Proposed)

Under Alternative I-A, there would be approximately 2,057 acres of initial ground disturbance with 155 miles of transmission line and 227 miles of access roads. A total of 52 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative I-A, including 33 prehistoric sites, 4 historic sites, 8 multi-component sites containing both prehistoric and historic components, and 7 sites with no descriptive information. The majority of prehistoric sites are open lithic sites with no features, ground stone or ceramics, and open camps. Historic sites consist mainly of artifact scatters with no evidence of structures or features, campsites, and historic trails and roads (including the Victory Highway [U.S. 40]). Of the 52 sites, 19 are eligible for the NRHP, 24 are not eligible, and 9 are unevaluated. It should be noted that unevaluated sites are treated as eligible until a determination of NRHP eligibility can be made. Average site density is comparatively low at 3 sites per 100 acres inventoried, with an average 14 percent of the alternative inventoried.

Alternative I-A would cross one segment of the Cherokee and Overland trails and one segment of the Rawlins to Baggs Road; the Lincoln Highway would not be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The segments of the Cherokee and Overland trails crossed by the alternative are both contributing segments to each trail's overall NRHP eligibility. At this time, it is unknown whether the segment of the Rawlins to Baggs Road crossed by the alternative is a contributing segment. This alternative would be visible from the Cherokee Trail for approximately 24 miles (10 of the 24 miles from contributing segments), the Rawlins to Baggs Road for approximately 9 miles (5 of the 9 miles from contributing segments), and the Overland Trail for approximately 9 miles (4 of the 9 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-A, the alternative would be visible from the highway for approximately 50 miles (4 of the 50 miles from contributing segments). Visibility of the alternative from historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative I-B

Under Alternative I-B, there would be approximately 2,083 acres of initial ground disturbance with 159 miles of transmission line and 223 miles of access roads. A total of 49 previously recorded cultural



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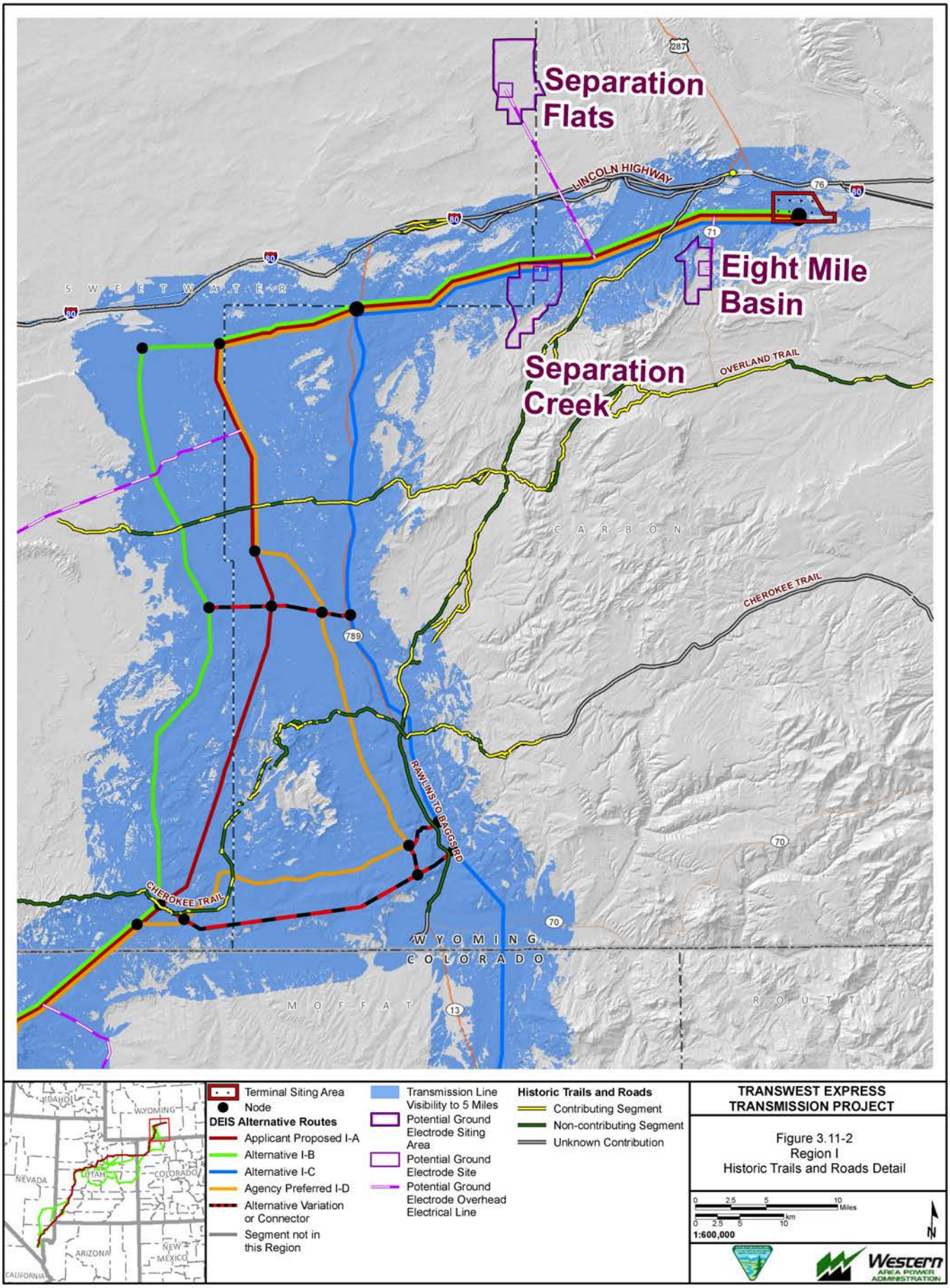

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resources have been identified within the 250-foot-wide transmission line ROW of Alternative I-B, including 25 prehistoric sites, 8 historic sites, 8 multi-components sites with both prehistoric and historic components, 1 potential TCP, and 7 sites with no descriptive information. The majority of prehistoric sites are open lithic sites with no features, ground stone or ceramics, open camps, and stone features. Historic sites consist mainly of artifact scatters with no evidence of structures or features, campsites, and historic trails and roads (including the Victory Highway [U.S. 40]). Of the previously recorded sites in the 250-foot-wide wide transmission line ROW, 19 are eligible for the NRHP, 21 are not eligible, and 8 are unevaluated. Average site density is comparatively high at 5 sites per 100 acres inventoried, with an average 9 percent of the alternative inventoried.

The Cherokee and Overland trails and Rawlins to Baggs Road each would be crossed once by Alternative I-B; no segments of the Lincoln Highway would be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The segments of the Cherokee and Overland trails crossed by the alternative are both contributing segments to each trail's overall NRHP eligibility. At this time, it is unknown whether the segment of the Rawlins to Baggs Road crossed by the alternative is a contributing segment. Alternative I-B would be visible from the Cherokee Trail for approximately 9 miles (4 of the 9 miles from contributing segments), the Overland Trail for approximately 9.7 miles (4 of the 9.7 miles from contributing segments), and the Rawlins to Baggs Road for approximately 9 miles (5 of the 9 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-B, the alternative would be visible from the highway for approximately 55 miles (4 of the 55 miles from contributing segments). Visibility of the alternative from the historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative I-C

Under Alternative I-C, there would be approximately 2,511 acres of initial ground disturbance with 186 miles of transmission line and 269 miles of access roads. A total of 45 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative I-C, including 22 prehistoric sites, 11 historic sites, 5 multi-component sites, and 7 sites with no descriptive information. Prehistoric sites consist mainly of open camps and open lithic sites while the majority of historic sites consist of artifact scatters, trails, roads (including the Victory Highway [U.S. 40]), and ditches/canals. Of the 45 sites previously recorded in the 250-foot-wide transmission line ROW, 24 are eligible for the NRHP, 7 are not eligible, and 14 are unevaluated. Average site density is 4 sites per 100 acres inventoried with an average 9 percent of the alternative inventoried.

Alternative I-C would cross the Overland and Cherokee trails once, and the Rawlins to Baggs Road three times; no segments of the Lincoln Highway would be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The segments of the Cherokee and Overland trails crossed by Alternative I-C are both contributing segments to the trail's overall NRHP eligibility. Of the three segments of the Rawlins to Baggs Road crossed by the alternative, one is a contributing segment. At this time, it is unknown whether the remaining two segments of the road are contributing segments. This alternative would be visible from the Overland Trail for approximately 7 miles (6 of the 7 miles from contributing segments), the Cherokee Trail for approximately 11 miles (4 of the 11 miles from contributing segments), and the Rawlins to Baggs Road for approximately 33 miles (10 of the 33 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-C, the alternative would be visible from the highway for approximately 48 miles (3 of the 48 miles from contributing segments). Visibility of Alternative I-C from the historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative I-D (Agency Preferred)

Under Alternative I-D, there would be approximately 2,306 acres of initial ground disturbance with 171 miles of transmission line and 242 miles of access roads. A total of 60 previously recorded cultural resources have been identified within of the 250-foot-wide transmission line ROW of Alternative I-D,

including 38 prehistoric sites, 6 historic sites, 9 multi-component sites, 1 potential TCP, and 6 sites with no descriptive information. Prehistoric sites mainly consist of open camps, open lithic, stone circles, and cairns. Historic sites mainly consist of artifact scatters, trails, roads (including the Victory Highway [U.S. 40]), and structures. Of the previously recorded sites, 19 are eligible for the NRHP, 29 are not eligible, and 11 are unevaluated. Average site density is 4.7 sites per 100 acres inventoried with a comparatively high average inventory coverage at 35 percent. The Tuttle Easement micro-siting option would not substantially affect the results of the cultural resources analysis.

Alternative I-D would cross the Cherokee Trail three times, and the Overland Trail and Rawlins to Baggs Road would be crossed once; the Lincoln Highway would not be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The three segments of the Cherokee Trail crossed by Alternative I-D are non-contributing segments to the trail's overall NRHP eligibility; whereas, the segment of the Overland Trail crossed by this alternative is a contributing segment. At this time, it is unknown whether the segment of the Rawlins to Baggs Road crossed by the alternative is a contributing segment. This alternative would be visible from the Cherokee Trail for approximately 28 miles (10 of the 28 miles from contributing segments), the Overland Trail for approximately 9.2 miles (4 of the 9.2 miles from contributing segments), and the Rawlins to Baggs Road for approximately 13.5 miles (5 of the 13.5 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-D, the alternative would be visible from the highway for approximately 50 miles (4 of the 50 miles from contributing segments). Visibility of the alternative from the historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Region I Conclusion

Initial ground disturbance associated with Alternative I-A would be less than the other alternatives. Decreased ground disturbance could decrease the potential for direct impacts to known and unknown historic properties compared to the other alternatives. Under Alternative I-A, historic trail and road crossings would be less than Alternatives I-C and I-D, but similar to Alternative I-B. Overall visibility of the transmission line from the historic trails, road, and highway would be 92 miles under Alternative I-A, which would be less than under alternatives I-C and I-D. There are 28 historic properties (including eligible and unevaluated sites) previously identified within the 250-foot-wide transmission line ROW of Alternative I-A, which is less than under Alternatives I-C and I-D. Compared to the other alternatives, Alternative I-A has fewer average sites per 100 acres inventoried with an average inventory coverage of 14 percent.

Alternative Connectors in Region I

Table 3.11-5 provides a summary of impacts for the alternative connectors.

Table 3.11-5 Summary of Region I Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Mexican Flats Alternative Connector	A total of 14 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Of these, 4 are NRHP-eligible, 6 are not eligible, and 4 are unevaluated. No historic trails or roads would be crossed by this alternative connector.	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of design features and BMPs. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.

Table 3.11-5 Summary of Region I Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Baggs Alternative Connector	A total of 21 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this connector. Of these, 6 are NRHP-eligible, 7 are not eligible, and 8 are unevaluated. The 21 resources include non-contributing segments of the Cherokee Trail and Rawlins to Baggs Road. This alternative connector would be visible from the trail for approximately 12 miles and from the road for approximately 12 miles.	Same conclusion as described above for the Mexican Flats Alternative Connector.
Fivemile Point North Alternative Connector	A non-contributing segment of the Rawlins to Baggs Road would be crossed once by this alternative connector. This alternative connector would be visible from the road for approximately 7.3 miles. No other cultural resources have been previously documented within the 250-foot-wide transmission line ROW of this connector.	Same conclusion as described above for the Mexican Flats Alternative Connector.
Fivemile Point South Alternative Connector	No cultural resources have been previously documented within the 250-foot-wide transmission line ROW of this connector. Although no historic trails or roads would be crossed by this alternative connector, it would be visible from the Rawlins to Baggs Road for approximately 3.5 miles.	Same conclusion as described above for the Mexican Flats Alternative Connector.

Sources: SWCA 2012a, 2011a.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the northern terminal as discussed in Chapter 2. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided in the Project POD. At this time, no files searches have been completed for the alternative ground electrode system locations in Region I. Cultural resources inventories, including a files search, would be conducted prior to construction. If historic properties are located within proposed disturbance areas and would be adversely affected, the properties would be avoided by Project redesign. However, if avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as outlined in the PA.

Table 3.11-6 provides a summary of potential impacts associated with the eight combinations of alternative route and location possibilities for the northern ground electrode system. Included in the table are disturbance acreages, miles of transmission line and access road, and the number of historic roads or trails crossed by the siting area and/or access road. It should be noted that direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction of the electrode systems.

Table 3.11-6 Summary of Region I Alternative Ground Electrode System Impacts

Alternative Ground Electrode System Locations	Analysis
Separation Flat – All Alternative Routes	Ground disturbance associated with this alternative ground electrode system location would be 128 acres. There would be 13 miles of transmission line and 17 miles of access road. The access road associated with the Separation Flat alternative ground electrode system would cross three non-contributing segments of the Lincoln Highway.
Shell Creek (Alternative I-A and I-D)	Ground disturbance associated with this alternative ground electrode system location would be 223 acres. There would be 33 miles of transmission line and 43 miles of access road. The access road associated with the Shell Creek alternative ground electrode system would cross one non-contributing segment of the Overland Trail.

Table 3.11-6 Summary of Region I Alternative Ground Electrode System Impacts

Alternative Ground Electrode System Locations	Analysis
Shell Creek (Alternative I-B)	Ground disturbance associated with this alternative ground electrode system location would be 189 acres. There would be 26 miles of transmission line and 34 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Little Snake East (Alternatives I-A, I-B, and I-D)	Ground disturbance associated with this alternative ground electrode system location would be 108 acres. There would be 9 miles of transmission line and 12 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Little Snake West (Alternative I-A)	Ground disturbance associated with this alternative ground electrode system location would be 121 acres. There would be 10 miles of transmission line and 14 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Little Snake West (Alternatives I-B and I-D)	Ground disturbance associated with this alternative ground electrode system location would be 93 acres. There would be 5 miles of transmission line and 7 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Separation Creek (All Alternative Routes)	Ground disturbance associated with this alternative ground electrode system location would be 138 acres. There would be 14 miles of transmission line and 20 miles of access road. No historic trails or roads would be crossed by the Separation Creek alternative ground electrode system.
Eight Mile Basin (All Alternative Routes)	Ground disturbance associated with this alternative ground electrode system location would be 86 acres. There would be 4 miles of transmission line and 6 miles of access road. No historic trails or roads would be crossed by the Eight Mile Basin alternative ground electrode system.

Sources: SWCA 2012a, 2011a.

3.11.6.4 Region II

Construction, operation, and decommissioning impacts in Region II and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. **Table 3.11-7** provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail crossings, visibility of the alternative from the historic trail, inventory coverage, site density, disturbance acreage, and miles of transmission line and access roads associated with each alternative route in Region II.

Table 3.11-7 Summary of Region II Alternative Route Impacts

Parameter		Alternative					
		II-A	II-B	II-C	II-D	II-E	II-F
Site Type	Prehistoric	8	44	58	26	8	26
	Historic	16	38	40	28	22	14
	Multi-component	1	7	7	3	2	1
	Potential TCPs[1]	1	8	10	4	1	4
	No information	1	7	5	1	1	2
Site Totals[2]		27	104	120	62	34	47

Table 3.11-7 Summary of Region II Alternative Route Impacts

Parameter		Alternative					
		II-A	II-B	II-C	II-D	II-E	II-F
Historic Trails Crossed	Old Spanish Trail	No segments crossed	4 segments crossed: 1 segment NHT II, 1 segment NHT III, 2 segments NHT V	9 segments crossed: 1 segment NHT II, 1 segment NHT III, 3 segments NHT V, and 4 segments not categorized	No segments crossed	No segments crossed	No segments crossed
	Visibility of the alternative from the Trail	No visibility	58 miles – 7 miles NHT II, 6 miles NHT III, 27 miles NHT IV, and 18 miles NHT V	107 miles – 17 miles NHT II, 8 miles NHT III, 31 miles NHT IV, 27 miles of NHT V, and 24 miles not categorized	No visibility	No visibility	No visibility
Average Percent Inventory Coverage		20 percent	19 percent	23 percent	19 percent	18 percent	22.4 percent
Average Site Density[3]		0.12 sites per 100 acres inventoried	0.25 sites per 100 acres inventoried	0.5 sites per 100 acres inventoried	0.1 sites per 100 acres inventoried	0.67 sites per 100 acres inventoried	0.09 sites per 100 acres inventoried
Initial Disturbance[4]		3,743 acres	5,003 acres	5,066 acres	4,055 acres	3,935 acres	4,276 acres
Miles of Transmission Line and Access Roads		257 miles; 463 miles	345 miles; 580 miles	364 miles: 556 miles	262 miles: 474 miles	266 miles; 471 miles	267 miles; 526 miles
NRHP Status[5]	Listed	0	1	1	0	0	0
	Eligible for Listing	13	48	45	26	17	20
	Not Eligible	13	30	40	29	16	20
	Unevaluated	0	17	24	3	0	3

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Sources: SWCA 2012b,c,e, 2011b,c.

Alternative II-A (Applicant Proposed)

Under Alternative II-A, there would be approximately 3,743 acres of initial ground disturbance with 257 miles of transmission line and 463 miles of access roads. A total of 27 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-A, including 8 prehistoric sites, 16 historic sites, 1 multi-component site, 1 potential TCP, and 1 site with no descriptive information. The majority of prehistoric sites are lithic scatters, open campsites, and lithic and ceramic scatters. Historic sites consist mainly of trash scatters, railroads, roads, and ditches/canals. Of the previously recorded sites in the 250-foot-wide transmission line ROW, 13 are eligible for the NRHP and 13 are not eligible. Average site density is 0.12 sites per 100 acres inventoried with comparatively high average inventory coverage at 20 percent. The Strawberry IRA micro-siting options would not

substantially affect the results of the cultural resources impact analyses. Alternative II-A would not cross or parallel the Old Spanish Trail.

Alternative II-B

Key Parameters Summary

Under Alternative II-B, there would be approximately 5,003 acres of initial ground disturbance with 345 miles of transmission line and 580 miles of access roads. A total of 104 previously recorded cultural resources have been identified within the 250-foot transmission line ROW of Alternative II-B, including 44 prehistoric sites, 38 historic sites, 7 multi-component sites, 8 potential TCPs, and 7 sites with no descriptive information. The majority of sites recorded in the ROW are prehistoric open campsites, lithic scatters, and limited activity areas, and historic artifact scatters, irrigation ditches, railroads, and roads. Of the previously recorded sites in the 250-foot transmission line ROW, 1 is listed on the NRHP, 48 are eligible for the NRHP, 30 are not eligible, and 17 are unevaluated. It should be noted that unevaluated sites are treated as eligible until a determination of NRHP eligibility can be made. Average site density is 0.25 site per 100 acres inventoried with an average of 19 percent inventory coverage.

As previously discussed, the information obtained from the National Historic Trails Inventory was used in the analysis of impacts to the Old Spanish Trail, which is a congressionally designated NHT. As part of the inventory, each trail segment was categorized under the NHT Condition Categories, which are inter-agency standard classifications designed to assess the comparative character of visible trail remnants observed during the inventory (AECOM 2012). The categories only encompass the condition of the trail tread, and do not reflect the scenic or historic character or integrity of the NHT setting or surrounding landscape. In addition, the categories are not intended to, nor do they provide criteria for, assessing the NRHP eligibility; however, they do provide an assessment of conditions that can be used as part of the NRHP evaluation. There are six NHT Condition Categories:

NHT I – Location verified, evident, and unaltered

NHT II – Location verified and evident with minor alteration

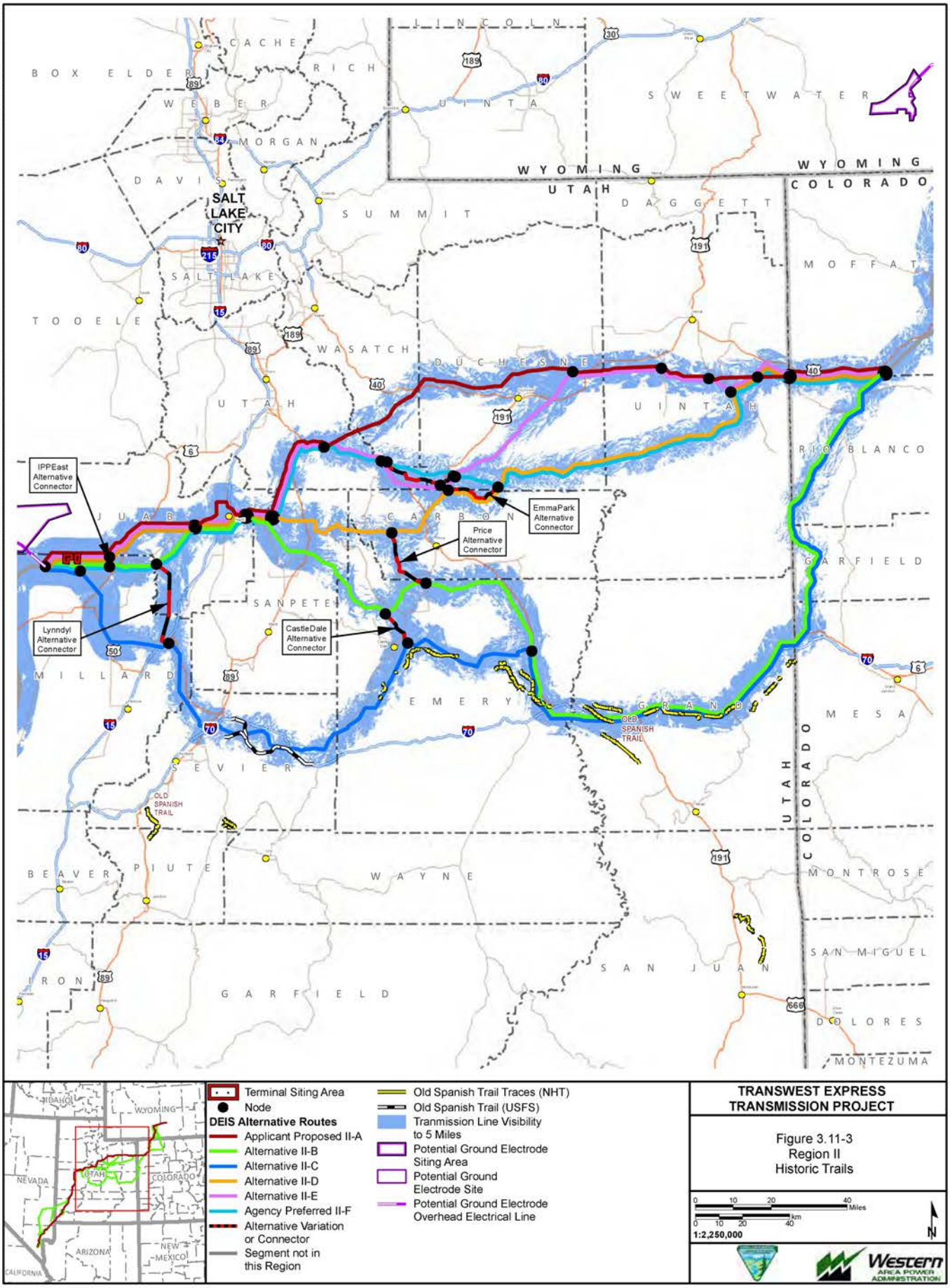
NHT III – Location verified with little remaining evidence

NHT IV – Location verified and permanently altered

NHT V – Location approximate or not verified

NHT VI – Location verified with historic reconstruction

Alternative II-B would cross the Old Spanish Trail four times (**Figure 3.11-3** and **Figure 3.11-4**). Of the four segments crossed by the alternative, one is categorized as NHT II, one is categorized as NHT III, and two are categorized as NHT V. This alternative would be visible from the Old Spanish Trail for approximately 58 miles. Of those 58 miles, approximately 7 miles of trail segments are categorized as NHT II, approximately 6 miles of trail segments are categorized as NHT III, approximately 27 miles of trail segments are categorized as NHT IV, and, approximately 18 miles are categorized as NHT V. Visibility of Alternative II-B from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.



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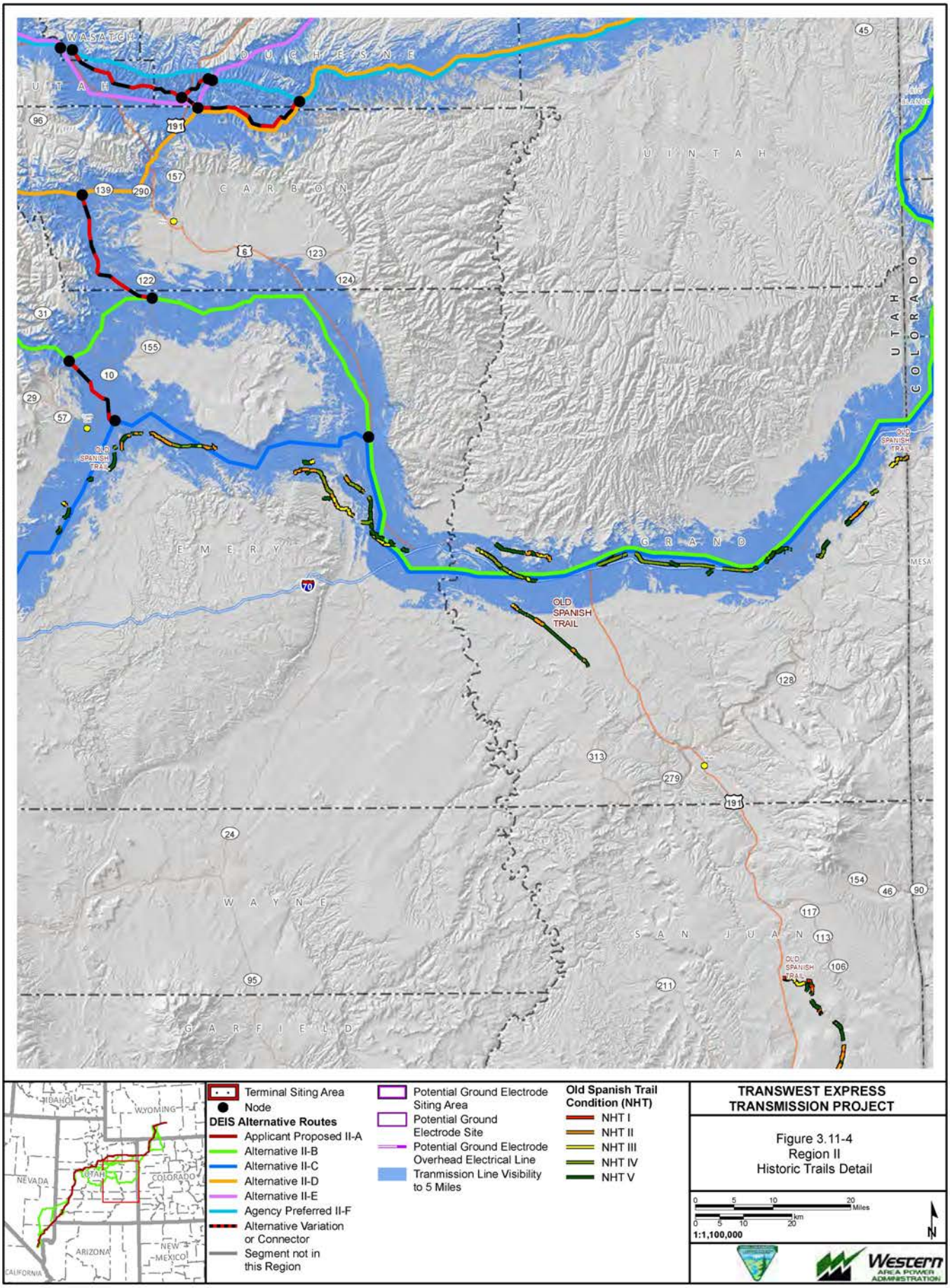

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-4
Region II
Historic Trails Detail

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Alternative II-C

Under Alternative II-C, there would be approximately 5,066 acres of initial ground disturbance with 364 miles of transmission line and 556 miles of access roads. A total of 120 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-C, including 58 prehistoric sites, 40 historic sites, 7 multi-component sites, 10 potential TCPs, and 5 sites with no descriptive information. Prehistoric sites mainly consist of lithic scatters and temporary campsites, while historic sites mainly consist of artifact scatters, habitation, roads, railroads, and ditches. Of the sites previously recorded in the 250-foot-wide transmission line ROW, 1 is listed on the NRHP, 45 are eligible for the NRHP, 40 are not eligible, and 24 are unevaluated. Average site density is 0.5 sites per 100 acres inventoried with comparatively high average inventory coverage at 23 percent.

This alternative would cross the Old Spanish Trail nine times (**Figure 3.11-3** and **Figure 3.11-4**). Of the nine segments crossed by the alternative, one is categorized as NHT II, one is categorized as NHT III, three are categorized as NHT V, and four are not categorized. The four segments not categorized are located on NFS lands; therefore, they were not part of the BLM's NHT inventory. Alternative II-C would be visible from the Old Spanish Trail for approximately 107 miles. Of those 107 miles, approximately 17 miles of trail segments are categorized as NHT II, approximately 8 miles are categorized as NHT III, approximately 31 miles are categorized as NHT IV, approximately 27 miles are categorized as NHT V, and approximately 24 miles are not categorized and are located on NFS lands. Visibility of the alternative from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative II-D

Under Alternative II-D, there would be approximately 4,055 acres of initial ground disturbance with 262 miles of transmission line and 474 miles of access roads. A total of 62 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-D, including 26 prehistoric sites, 28 historic sites, 3 multi-component sites, 4 potential TCPs, and 1 site with no descriptive information. The majority of sites include prehistoric lithic scatters and temporary campsites, and historic ditches, roads, structures, and artifact scatters. Of the sites previously recorded in the 250-foot-wide transmission line ROW, 26 are eligible for the NRHP, 29 are not eligible, and 3 are unevaluated. Average site density is 0.1 sites per 100 acres inventoried with an average of 19 percent inventory coverage.

Alternative II-D would not cross or parallel the Old Spanish Trail.

Alternative II-E

Under Alternative II-E, there would be approximately 3,935 acres of initial ground disturbance with 266 miles of transmission line and 471 miles of access roads. A total of 34 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-E, including 8 prehistoric sites, 22 historic sites, 2 multi-component sites, 1 potential TCP, and 1 site with no descriptive information. Of the previously recorded sites, 17 are eligible for the NRHP and16 are not eligible. The majority of previously recorded sites include historic trash scatters, structures, ditches/canals, and roads, and prehistoric open campsites and lithic scatters. Average site density is comparatively high at 0.67 sites per 100 acres inventoried with a comparatively low average inventory coverage of 18 percent.

Alternative II-E would not cross or parallel the Old Spanish Trail.

Alternative II-F (Agency Preferred)

Under Alternative II-F, there would be approximately 4,276 acres of initial ground disturbance with 267 miles of transmission line and 526 miles of access roads. A total of 47 previously recorded cultural

resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-F, including 26 prehistoric sites, 14 historic sites, 1 multi-component site, 4 potential TCPs, and 2 sites with no descriptive information. The majority of previously recorded sites include historic trash scatters, structures, ditches/canals, and roads and prehistoric open campsites and lithic scatters. Of the sites previously recorded in the 250-foot-wide transmission line ROW, 20 are eligible for the NRHP, 20 are not eligible, and 3 are unevaluated. Average site density is comparatively low at 0.09 sites per 100 acres inventoried with a comparatively high average inventory coverage of 22.4 percent.

Alternative II-F would not cross or parallel the Old Spanish Trail. The Cedar Knoll IRA micro-siting options would not substantially affect the results of the cultural resources impact analyses.

Region II Conclusion

Initial ground disturbance associated with Alternative II-A would be less than the other alternatives. Decreased ground disturbance could decrease the potential for direct impacts to known and unknown historic properties compared to the other alternatives. Under Alternative II-A, no segments of the Old Spanish Trail would be crossed nor would the alternative be visible from the trail. In comparison, Alternatives II-B and II-C would cross the trail 4 times and 9 times, respectively, and would be visible from the trail for more than 50 miles. There are 13 historic properties previously identified within the 250-foot-wide transmission line ROW of Alternative II-A, which is less than the other alternatives. Average site density for Alternative II-A is relatively similar to the other alternatives; whereas, the average inventory coverage of 20 percent is lower than Alternatives II-C and II-F.

Alternative Variation in Region II

Table 3.11-8 summarizes the impacts associated with the alternative variation in Region II.

Table 3.11-8 Summary of Region II Alternative Variation Impacts

Alternative Variation	Analysis
Emma Park Alternative Variation	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of the Emma Park Alternative Variation. In comparison, one ineligible historic site has been previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative II-F it would replace. No segments of the Old Spanish Trail would be crossed by the alternative variation or portion of the alternative it would replace. Ground disturbance associated with the Emma Park Alternative Variation would be 1,959 acres (including access roads) compared to 1,909 acres (including access roads) of initial disturbance associated with the portion of Alternative II-F it would replace.

Alternative Connectors in Region II

Table 3.11-9 summarizes the impacts associated with the alternative connectors in Region II.

Table 3.11-9 Summary of Region II Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Highway 191 Alternative Connector	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector.	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of the design

Table 3.11-9 Summary of Region II Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
		features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.
Lynndyl Alternative Connector	A total of two cultural resources have been previously documented within the 250-foot-wide transmission line ROW of this alternative connector. Both resources have been previously evaluated as not eligible for the NRHP.	Same conclusion as described above for the Highway 191 Alternative Connector.
IPP East Alternative Connector	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector.	Same conclusion as described above for the Highway 191 Alternative Connector.
Price Alternative Connector	A total of 11 cultural resources have been previously documented in the 250-foot-wide transmission line ROW of this alternative connector. Of these, four are eligible for the NRHP, six are not eligible, and one is unevaluated.	Same conclusion as described above for the Highway 191 Alternative Connector.
Castle Dale Alternative Connector	A total of four cultural resources have been previously documented in the 250-foot-wide transmission line ROW of this alternative connector. Of these, one is eligible for the NRHP, two are not eligible, and one is unevaluated.	Same conclusion as described above for the Highway 191 Alternative Connector.

Sources: SWCA 2012c,e, 2011c.

3.11.6.5 Region III

Construction, operation, and decommissioning impacts in Region III and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. **Table 3.11-10** provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail crossings, visibility of the alternative from the historic trail, inventory coverage, site density, disturbance acreage, and miles of transmission line associated with each alternative route in Region III.

Table 3.11-10 Summary of Region III Alternative Route Impacts for Cultural Resources

Parameter		Alternative III-A	Alternative III-B	Alternative III-C
Site Type	Prehistoric	23	40	49
	Historic	13	7	10
	Multi-component	1	1	1
	Potential TCPs[1]	3	11	5
	No Information	7	4	5
Site Totals[2]		47	63	70

Table 3.11-10 Summary of Region III Alternative Route Impacts for Cultural Resources

Parameter		Alternative III-A	Alternative III-B	Alternative III-C
Historic Trail Crossed and Visibility	Old Spanish Trail	3 segments crossed: 1 segment categorized as NHT I; 2 segments not categorized	No segments crossed	No segments crossed
	Visibility of the alternative from the Trail	23 miles - 8 miles NHT I, 2 miles NHT II, 0.1 mile NHT IV, and 13 miles not categorized	6.2 miles – 4.8 miles NHT I, 1.3 miles NHT II, and 0.1 mile NHT IV	No visibility
Average Percent Inventory Coverage		20 percent	23 percent	20 percent
Average Site Density[3]		0.02 sites per 100 acres inventoried	1.7 sites per 100 acres inventoried	0.01 sites per 100 acres inventoried
Initial Disturbance[4]		3,641 acres	3,593 acres	3,926 acres
Miles of Transmission Line and Access Roads		276 miles; 423 miles	285 miles; 401 miles	308 miles; 433 miles
NRHP Status[5]	Listed	0	1	1
	Eligible for Listing	23	15	29
	Not Eligible	10	22	24
	Unevaluated	11	14	11

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

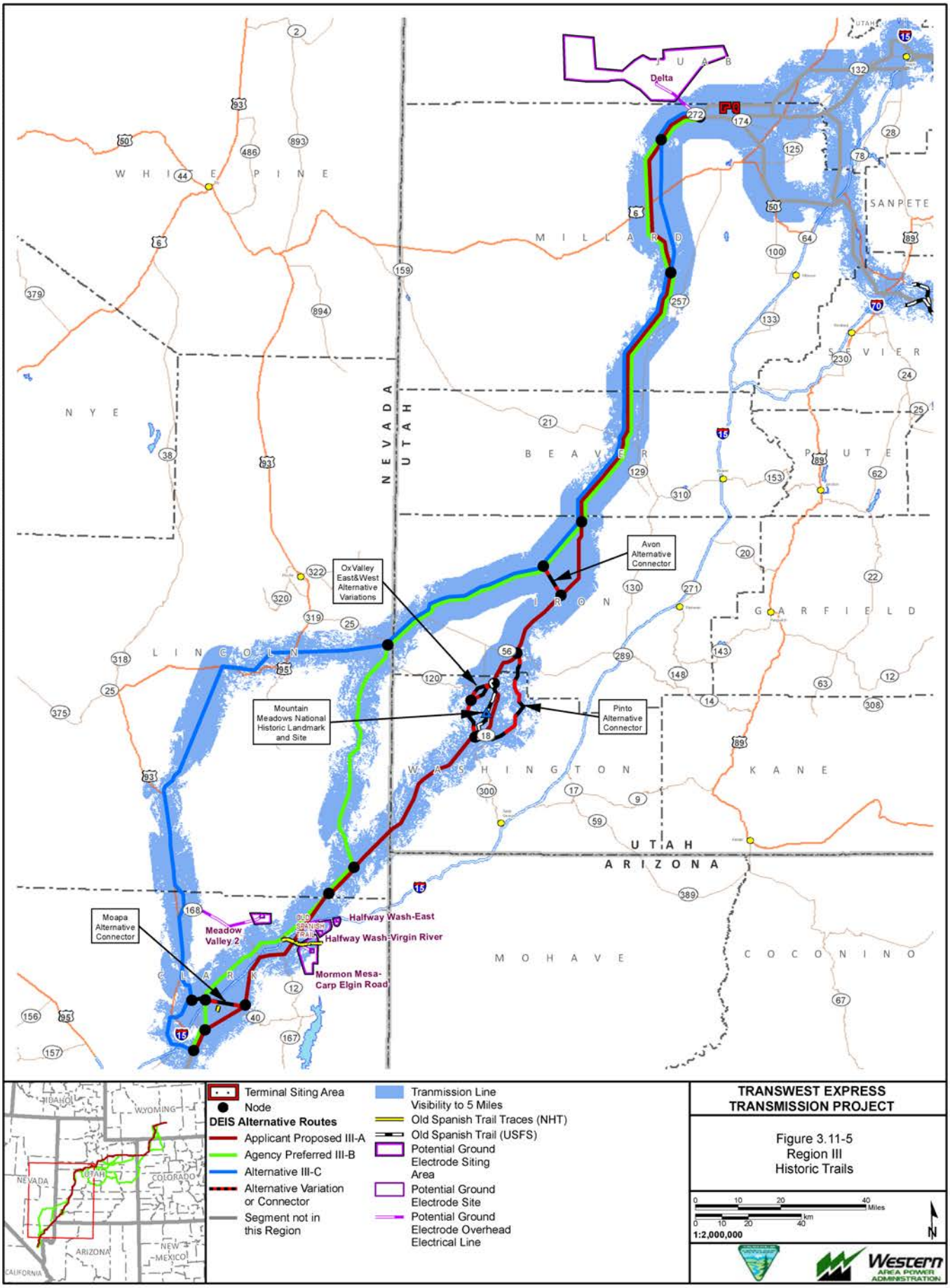
[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Sources: SWCA 2012c,d,e, 2011c,.

Alternative III-A (Applicant Proposed)

Under Alternative III-A, there would be approximately 3,641 acres of initial ground disturbance with 276 miles of transmission line and 423 miles of access roads. A total of 47 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative III-A, including 23 prehistoric sites, 13 historic sites, 1 multi-component site with both prehistoric and historic components, 3 potential TCPs, and 7 sites with no descriptive information. Prehistoric sites consist mainly of open campsites and lithic scatters; historic sites mainly consist of artifact scatters, structures, and roads. Of the previously recorded sites, 23 are eligible for the NRHP, 10 are not eligible, and 11 are unevaluated. It should be noted that unevaluated sites are treated as eligible until a determination of NRHP eligibility can be made. The Mountain Meadows Massacre Site and Mountain Meadows NHL are located approximately 0.5 mile from Alternative III-A (see Section 3.12, Visual Resources, for the results of the viewshed analysis conducted for the Mountain Meadows Massacre Site). Average site density is 0.02 sites per 100 acres inventoried with an average 20 percent inventory coverage.

The Old Spanish Trail would be crossed three times by Alternative III-A (**Figures 3.11-5**, **3.11-6**, and **3.11-7**); one segment is categorized as NHT I (location verified, evident, and unaltered) and two segments are not categorized. The two segments not categorized are located on NFS lands; therefore, they were not part of the BLM's NHT inventory. Alternative III-A would be visible from the Old Spanish Trail for approximately 23 miles. Of those 23 miles, approximately 8 miles of trail segments are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C O C O N I N O
C L A R K
Avon Alternative Connector
OxValley East&West Alternative Variations
Mountain Meadows National Historic Landmark and Site
Pinto Alternative Connector
Moapa Alternative Connector
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
OLD SPANISH TRAIL
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Tranmission Line Visibility to 5 Miles
Old Spanish Trail Traces (NHT)
Old Spanish Trail (USFS)
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.11-5
Region III
Historic Trails
0 10 20 40 Miles
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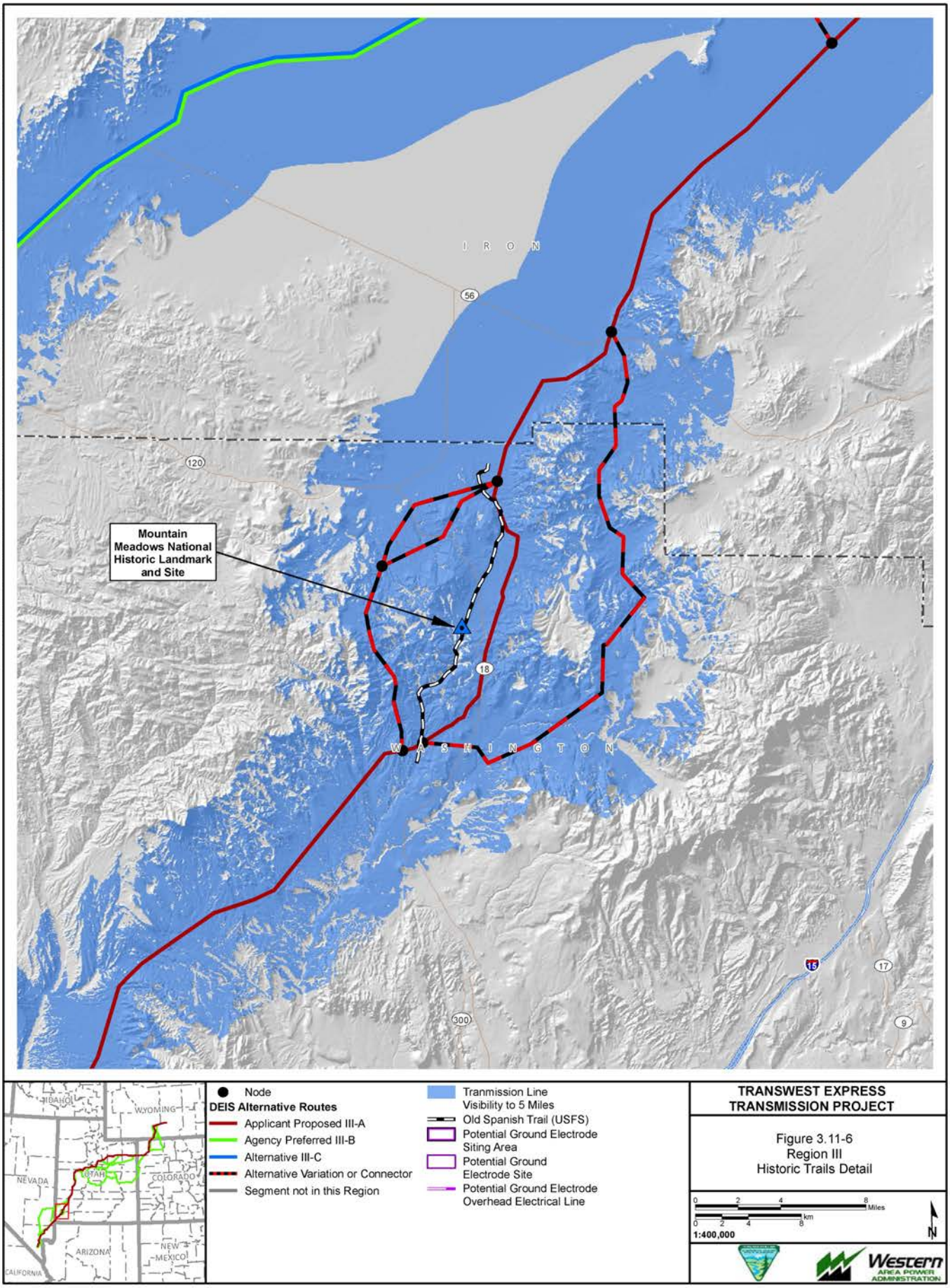

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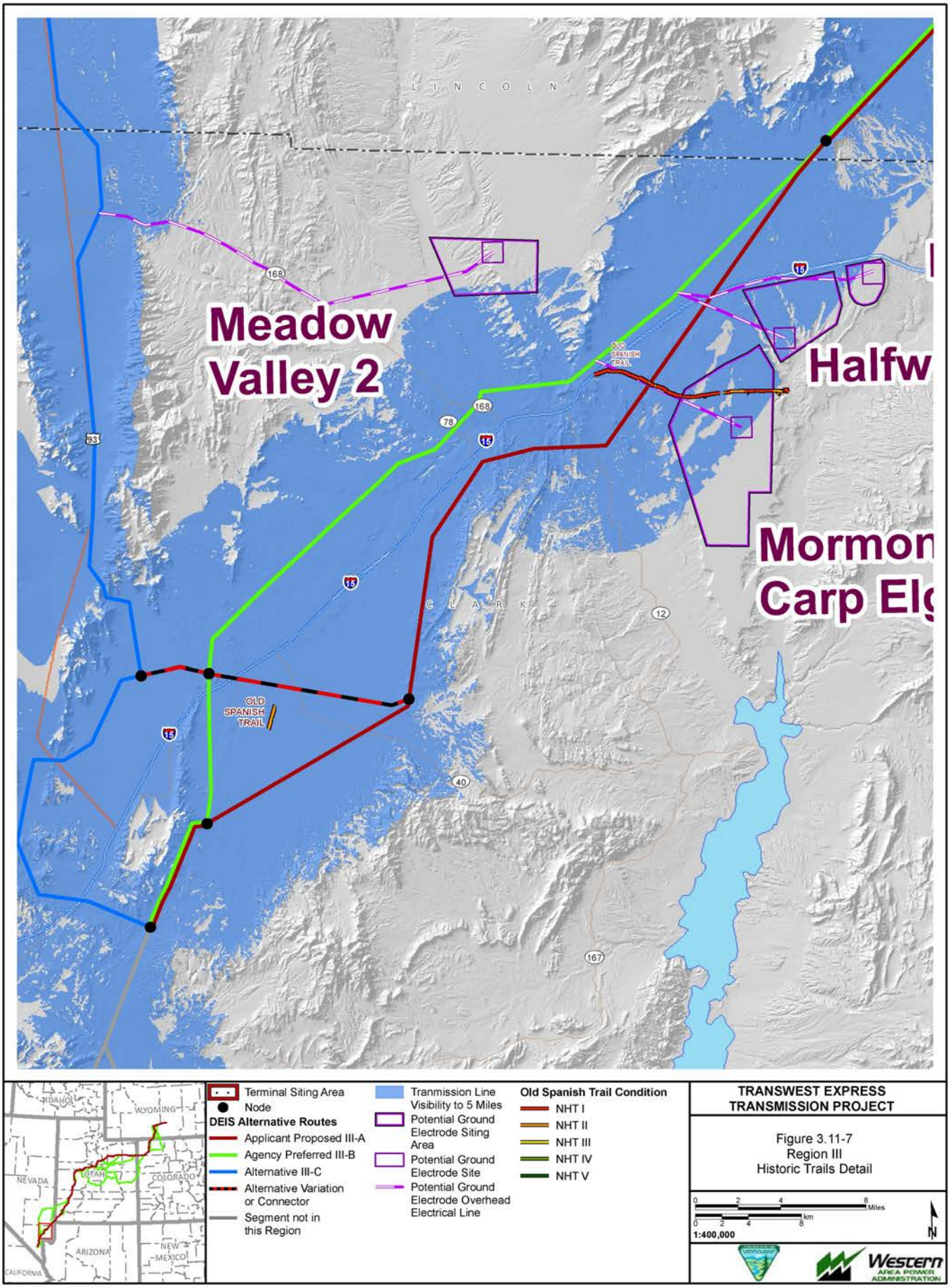

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categorized as NHT I, approximately 2 miles of trail segments are categorized as NHT II (location verified and evident with minor alteration), approximately 0.1 mile is categorized as NHT IV (location verified and permanently altered), and approximately 13 miles are not categorized. Visibility of Alternative III-A from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative III-B (Agency Preferred)

Under Alternative III-B, there would be approximately 3,593 acres of initial ground disturbance with 285 miles of transmission line and 401 miles of access roads. A total of 63 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative III-B, including 40 prehistoric sites, 7 historic sites, 1 multi-component sites, 11 potential TCPs, and 4 sites with no descriptive information. The majority of prehistoric sites are open camps, temporary campsites, and lithic scatters, while the majority of historic sites are artifact scatters. Of the previously recorded sites, 1 is listed on the NRHP, 15 are eligible for the NRHP, 22 are not eligible, and 14 are unevaluated. Included in the 63 sites is the NRHP-listed Panaca Summit Archaeological District, which contains over 70 prehistoric sites in an area extending over 7,000 acres. The Mountain Meadows Massacre Site and Mountain Meadows NHL are located approximately 31 miles from Alternative III-B. Average site density is comparatively high at 1.7 sites per 100 acres inventoried with a comparatively high average inventory coverage of 23 percent.

The Old Spanish Trail would not be crossed by Alternative III-B (**Figures 3.11-5**, **3.11-6**, and **3.11-7**). Although the Old Spanish Trail would not be crossed by the Alternative III-B, the alternative would be visible from the trail for approximately 6.2 miles. Of those 6.2 miles, approximately 4.8 miles of trail segments are categorized as NHT I (location verified, evident, and unaltered), approximately 1.3 miles of trail segments are categorized as NHT II (location verified and evident with minor alteration), and approximately 0.1 mile is categorized as NHT IV (location verified and permanently altered). Visibility of the alternative from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative III-C

Under Alternative III-C, there would be approximately 3,926 acres of initial ground disturbance with 308 miles of transmission line and 433 miles of access roads. A total of 70 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative III-C, including 49 prehistoric sites, 10 historic sites, 1 multi-component site, 5 potential TCPs, and 5 sites with no descriptive information. Most of the sites consist of prehistoric open and sheltered lithic sites and open camps, while most of the historic sites are trash scatters. Of the previously recorded sites, 1 is listed on the NRHP, 29 are eligible for the NRHP, 24 are not eligible, and 11 are unevaluated. Included in the 70 sites is the NRHP-listed Panaca Summit Archaeological District, which contains over 70 prehistoric sites in an area extending over 7,000 acres. The Mountain Meadows Massacre Site and Mountain Meadows NHL are located approximately 28 miles from Alternative III-C. Average site density is 0.01 sites per 100 acres inventoried with an average inventory coverage of 20 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative III-C.

Region III Conclusion

Alternative III-A would have more acres of initial ground disturbance than Alternative III-B, but less than Alternative III-C. Fewer previously recorded historic properties (including both eligible and unevaluated sites) have been identified within Alternative III-A compared to the other alternatives, with an average site density of 0.02 sites per 100 acres inventoried and an average of 20 percent inventory coverage. In addition, Alternative III-A would not cross the NRHP-listed Panaca Summit Archaeological District. Alternative III-A would be located 0.5 mile from the Mountain Meadows Massacre Site and NHL; whereas, the other two alternatives are over 28 miles from the site and NHL. As such, Alternative III-A

would have a greater potential to visually impact the Mountain Meadows Massacre Site and Mountain Meadows NHL due to its close proximity and a greater potential to directly impact unmarked graves associated with the massacre site (the exact locations of all of the gravesites are unknown). The Old Spanish Trail would be crossed by Alternative III-A, but not by the other alternatives. Additionally, Alternative III-A would be visible from the trail for approximately 23 miles (8 miles categorized as NHT I), which would be more than the other two alternatives.

Alternative Variations in Region III

Table 3.11-11 provides a comparison of impacts associated with the alternative variations in Region III.

Table 3.11-11 Summary of Region III Alternative Variation Impacts

Alternative Variation	Analysis
Ox Valley East Alternative Variation	A total of 5 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of the Ox Valley East Alternative Variation compared to 36 cultural resources previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative III-A it would replace. For the variation, 4 of the sites are NRHP-eligible. Along the portion of Alternative III-A that would be replaced by the variation, 18 of the 36 sites are NRHP-eligible, 12 are not eligible, and 6 are unevaluated. Based on the files search of the Ox Valley East Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 39 percent of the files search area (2-mile transmission line corridor). Average site density for the files search area is approximately 0.003 sites per 100 acres inventoried. In comparison, the average percentage of inventory coverage is approximately 11 percent with average site density at 0.006 sites per 100 sites inventoried for the portion of Alternative III-A, which would be replaced by the alternative variation. A non-categorized segment of the Old Spanish Trail would be crossed by the alternative variation, whereas two non-categorized segments of the trail would be crossed by the portion of the alternative it would replace. Visibility of the alternative variation from the trail would be approximately 6 miles compared to 13 miles for the portion of Alternative III-A it would replace. The variation would be located approximately 3 miles from the Mountain Meadows Massacre Site and Mountain Meadows NHL. In comparison, the portion of Alternative III-A that would be replaced by the variation would be located 0.12 mile from the Mountain Meadows Massacre Site and Mountain Meadows NHL. Ground disturbance associated with the Ox Valley East Alternative Variation would be 276 acres compared to 252 acres of initial disturbance associated with the portion of Alternative III-A it would replace.
Ox Valley West Alternative Variation	A total of 3 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of the Ox Valley West Alternative Variation compared to 36 cultural resources previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative III-A it would replace. For the variation, 2 of the sites are NRHP-eligible. Along the portion of Alternative III-A that would be replaced by the variation, 18 of the 23 sites are NRHP-eligible, 12 are not eligible, and 6 are unevaluated. Based on the files search of the Ox Valley West Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 43 percent of the files search area (2-mile transmission line corridor). Average site density for the files search area is approximately 0.003 sites per 100 acres inventoried. In comparison, the average percentage of inventory coverage is approximately 11 percent with average site density at 0.006 sites per 100 sites inventoried for the portion of Alternative III-A that would be replaced by the alternative variation. A non-categorized segment of the Old Spanish Trail would be crossed by the alternative variation, whereas two non-categorized segments of the trail would be crossed by the portion of the alternative it would replace. Visibility of the alternative variation from the trail would be approximately 6 miles compared to 13 miles for the portion of Alternative III-A it would replace. The variation would be located approximately 3 miles from the Mountain Meadows Massacre Site and Mountain Meadows NHL. In comparison, the portion of Alternative III-A that would be replaced by the variation would be located 0.1 mile from the Mountain Meadows Massacre Site and Mountain Meadows NHL. Ground disturbance associated with the Ox Valley West Alternative Variation would be 268 acres compared to 252 acres of initial disturbance associated with the portion of Alternative III-A it would replace.

Table 3.11-11 Summary of Region III Alternative Variation Impacts

Alternative Variation	Analysis
Pinto Alternative Variation[1]	A total of 40 cultural resources have been previously recorded within the transmission line ROW of the Pinto Alternative Variation compared to 39 cultural resources previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative III-A it would replace. For the variation, 13 of the sites are NRHP-eligible, 15 are not eligible, and 12 are unevaluated (BLM 2011). Along the portion of Alternative III-A that would be replaced by the variation, 20 of the 39 sites are NRHP-eligible, 13 are not eligible, and 6 are unevaluated. Based on the files search of the Pinto Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 46 percent compared to 11 percent for the portion of Alternative III-A it would replace. No segment of the Old Spanish Trail would be crossed by the alternative variation, but a non-categorized segment would be crossed by the portion of the alternative it would replace. Although the alternative variation would not cross the trail, it would be visible from the trail for approximately 3 miles. In comparison, the portion of the alternative that would be replaced by the variation would be visible for 13 miles. This alternative variation would be located approximately 5 miles from the Mountain Meadows Massacre Site and Mountain Meadows NHL. In comparison, the portion of Alternative III-A that would be replaced by the variation would be located 0.1 mile from the Mountain Meadows Massacre Site and Mountain Meadows NHL. Ground disturbance associated with the Pinto Alternative Variation would be 449 acres compared to 381 acres of initial disturbance associated with the portion of Alternative III-A it would replace.

[1] The cultural resources information for the Pinto Alternative Variation was tiered off of the Sigurd to Red Butte No. 2 – 345kV Transmission Project EIS (BLM 2011). The Sigurd to Red Butte transmission line ROW is 350 feet; whereas, the TWE transmission line ROW is 250 feet. As such, the site counts for the Pinto Alternative Variation are based on a larger area and are not a direct comparison to the portion of Alternative III-A it would replace.

Sources: BLM 2011; SWCA 2012c,e, 2011c.

Alternative Connectors in Region III

Table 3.11-12 summarizes the impacts associated with the alternative connectors in Region III.

Table 3.11-12 Summary of Region III Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Moapa Alternative Connector	A total of four cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Of those, one is NRHP-eligible, one is not eligible, and two are unevaluated. The alternative connector would be visible from the Old Spanish Trail for approximately 1 mile. The 1-mile segment is categorized as NHT II (location verified and evident with minor alteration).	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of design features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.
Avon Alternative Connector	One NRHP-eligible cultural resource has been previously recorded within the 250-foot-wide transmission line ROW of the Avon Alternative Connector.	Same as described above for the Moapa Alternative Connector.

Sources: SWCA 2012c,d,e, 2011c,d.

Alternative Ground Electrode Systems in Region III

The southern ground electrode system would be necessary within 100 miles of the southern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided in the Project POD. At this time,

no files searches have been completed for the alternative ground electrode system locations in Region III. Cultural resources inventories, including a files search, would be conducted prior to construction. If historic properties are located within proposed disturbance areas and would be adversely affected, the properties would be avoided by Project redesign. However, if avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as outlined in the PA.

Table 3.11-13 provides a summary of impacts associated with the four combinations of alternative route and location possibilities for the southern ground electrode system. Included in the table are disturbance acreages, miles of transmission line and access road, and the number of historic roads or trails crossed by the siting area and/or access road. It should be noted that direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction of the electrode systems.

Table 3.11-13 Summary of Region III Alternative Ground Electrode System Location Impacts

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	Ground disturbance associated with this alternative ground electrode system location would be 91 acres. There would be 6 miles of transmission line and 7 miles of access road. The access road associated with this ground electrode system would intersect and parallel the Old Spanish Trail for approximately 4.45 miles. Of those 4.45 miles, 3.65 miles are categorized as NHT I (location verified, evident, and unaltered), 0.7 mile as NHT II (location verified and evident with minor alteration), and 0.1 mile as NHT IV (location verified and permanently altered).
Halfway Wash –Virgin River (Alternative III-A)	Ground disturbance associated with this alternative ground electrode system location would be 84 acres. There would be 4 miles of transmission line and 5 miles of access road. No segments of the Old Spanish Trail would be crossed by this ground electrode system.
Halfway Wash East (Alternative III-A)	Ground disturbance associated with this alternative ground electrode system location would be 104 acres. There would be 8 miles of transmission line and 10 miles of access road. No segments of the Old Spanish Trail would be crossed by this alternative ground electrode system.
Mormon Mesa-Carp Elgin Rd (Alternative III-B)	Ground disturbance associated with this alternative ground electrode system location would be 103 acres. There would be 8 miles of transmission line and 10 miles of access road. The Mormon Mesa-Carp Elgin Rd (Alternative III-B) alternative ground electrode system associated access road would intersect and parallel the Old Spanish Trail for approximately 4.45 miles. Of those 4.45 miles, 3.65 miles are categorized as NHT I (location verified, evident, and unaltered), 0.7 mile as NHT II (location verified and evident with minor alteration), and 0.1 mile as NHT IV (location verified and permanently altered).
Halfway Wash –Virgin River (Alternative III-B)	Ground disturbance associated with this alternative ground electrode system location would be 93 acres. There would be 6 miles of transmission line and 7 miles of access road. No segments of the Old Spanish Trail would be crossed by this alternative ground electrode system.
Halfway Wash East (Alternative III-B)	Ground disturbance associated with this alternative ground electrode system location would be 102 acres. There would be 8 miles of transmission line and 10 miles of access road. No segments of the Old Spanish Trail would be crossed by this alternative ground electrode system.
Meadow Valley 2 (Alternative III-C)	Ground disturbance associated with this alternative ground electrode system location would be 174 acres. There would be 22 miles of transmission line and 29 miles of access road. No segments of the Old Spanish Trail would be crossed by the Meadow Valley 2 alternative ground electrode system.
Delta (Design Option 2)	Ground disturbance associated with this alternative ground electrode system location would be 160 acres. There would be 19 miles of transmission line and 23 miles of access road. No segments of the Old Spanish Trail would be crossed by the Delta ground electrode system.

Sources: SWCA 2012a,c,d, 2011a,c,d.

3.11.6.6 Region IV

Construction, operation, and decommissioning impacts in Region IV and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. **Table 3.11-14** provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail crossings, inventory coverage, site density, disturbance acreage, and miles of transmission line associated with each alternative route in Region IV.

Table 3.11-14 Summary of Region IV Alternative Route Impacts

Parameter		Alternative IV-A	Alternative IV-B	Alternative IV-C
Site Types	Prehistoric	10	7	7
	Historic	8	16	29
	Multi-component	0	0	0
	Potential TCPs[1]	8	7	7
	No Information	1	0	0
Site Totals[2]		27	30	43
Historic Trail Crossed	Old Spanish Trail	No segments crossed	No segments crossed	No segments crossed
Average Percent Inventory Coverage		39 percent	34 percent	32 percent
Average Site Density[3]		0.007 sites per 100 acres inventoried	0.005 sites per 100 acres inventoried	0.005 sites per 100 acres inventoried
Initial Disturbance[4]		566 acres	573 acres	663 acres
Miles of Transmission Line and Access Roads		37 miles; 60 miles	39 miles; 71 miles	44 miles; 74 miles
NRHP Status[5]	Listed	2	0	0
	Eligible for Listing	6	12	17
	Not Eligible	7	5	12
	Unevaluated	4	6	7

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Sources: SWCA 2012d,e, 2011d.

<u>Alternative IV-A (Applicant Proposed/Agency Preferred)</u>

Under Alternative IV-A, there would be approximately 566 acres of initial ground disturbance with 37 miles of transmission line and 60 miles of access roads. A total of 27 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative IV-A, including 10 prehistoric sites, 8 historic sites, 8 potential TCPs, and 1 site with no descriptive information. The majority of prehistoric sites are open lithic and open architectural (e.g., stone circles,

stone features), while the majority of historic sites are artifact scatters and structures. Of the previously recorded sites, 2 are listed on the NRHP, 6 are eligible for the NRHP, 7 are not eligible, and 4 are unevaluated. It should be noted that unevaluated sites are considered eligible until a determination of NRHP eligibility can be made. A historic ditch/canal and prehistoric open lithic site are listed on the NRHP and are located within the 250-foot-wide transmission line ROW. Average site density is 0.007 sites per 100 acres inventoried with a comparatively high average inventory coverage of 39 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative IV-A.

Alternative IV-B

Under Alternative IV-B, there would be approximately 573 acres of initial ground disturbance with 39 miles of transmission line and 71 miles of access roads. A total of 30 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative IV-B, including 7 prehistoric sites, 16 historic sites, and 7 potential TCPs. Prehistoric sites mainly consist of sheltered lithic and open lithic sites, while historic sites are mainly habitation sites, roads, and structures. Of the previously recorded sites, 12 are eligible for the NRHP, 5 are not eligible, and 6 are unevaluated. Average site density is 0.005 sites per 100 acres inventoried with an average inventory coverage of 34 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative IV-B.

Alternative IV-C

Under Alternative IV-C, there would be approximately 663 acres of initial ground disturbance with 44 miles of transmission line and 74 miles of access roads. A total of 43 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative IV-C, including 7 prehistoric sites, 29 historic sites, and 7 potential TCPs. Open and sheltered lithic sites comprise the majority of prehistoric sites, while artifact scatters, roads, and structures comprise the majority of historic sites. Of the previously recorded sites, 17 are eligible for the NRHP, 12 are not eligible, and 7 are unevaluated. Average site density is 0.005 sites per 100 acres inventoried with a comparatively low average inventory coverage of 32 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative IV-C.

Region IV Conclusion

Alternative IV-A would have less acres of ground disturbance than Alternatives IV-B and IV-C. Decreased ground disturbance could decrease the potential for direct impacts to known and unknown historic properties compared to the other alternatives. Alternative IV-A also has a smaller number of previously recorded NRHP-eligible and unevaluated sites than the other alternatives, with an average site density of 0.007 sites per 100 acres inventoried and average inventory coverage of 39 percent.

Alternative Variations in Region IV

Table 3.11-15 provides a comparison of impacts associated with the alternative variations in Region IV.

Table 3.11-15 Summary of Region IV Alternative Variation Impacts

Alternative Variation	Analysis
Marketplace Alternative Variation	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative variation, compared to one previously recorded cultural resources along the portion of Alternative IV-B that would be replaced by the variation. The one cultural resource is eligible for the NRHP. Based on the files search of the Marketplace Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 34 percent of the files search area (2-mile transmission line corridor). Average site density for the files search area is approximately 0.001 sites per 100 acres inventoried. In comparison, the average percentage of inventory coverage is approximately 36 percent with average site density at 0.001 sites per 100 sites inventoried for the portion of Alternative IV-B would be replaced by the alternative variation. Ground disturbance associated with the Marketplace Alternative Variation would be 109 acres compared to 82 acres of initial disturbance associated with the portion of Alternative IV-B it would replace.

Source: SWCA 2011d.

Alternative Connectors in Region IV

Table 3.11-16 summarizes the impacts associated with the alternative connectors in Region IV.

Table 3.11-16 Summary of Region IV Alternative Connector Impacts

Alternative Connectors	Analysis	Conclusion
Sunrise Mountain Alternative Connector	No cultural resources have been previously recorded within the alternative connector 250-foot-wide transmission line ROW.	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of design features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.
Lake Las Vegas Alternative Connector	A total of three cultural resources, including the Las Vegas Wash Archaeological District, have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Two of the three resources are eligible for the NRHP.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.
Three Kids Mine Alternative Connector	A total of four cultural resources, including the Las Vegas Wash Archaeological District, have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. One of the four resources is eligible for the NRHP.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.
River Mountains Alternative Connector	A total of one cultural resource has been previously recorded within the 250-foot-wide transmission line ROW. The one cultural resource is eligible for the NRHP.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.

Table 3.11-16 Summary of Region IV Alternative Connector Impacts

Alternative Connectors	Analysis	Conclusion
Railroad Pass Alternative Connector	A total of three cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Of these, one is eligible for the NRHP, and two are not eligible.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.

Source: SWCA 2011d.

3.11.6.7 Residual Impacts

The Project would result in the loss of cultural resources that are not eligible for the NRHP and located in proposed disturbance areas. Although these sites would be recorded to BLM standards and the information integrated into local and statewide archaeological databases, the sites ultimately would be destroyed by construction. It currently is unknown how many historic properties (including TCPs or other properties of tribal importance) would be affected by the Project. Design features for cultural resources protection would be followed. Adverse effects to historic properties would be avoided or, if avoidance is not feasible, minimized or mitigated as stipulated in the PA. Mitigation could include data recovery, the use of landscaping to minimize visual effects, development of interpretive materials, or other measures determined by the BLM in consultation with the SHPO and interested parties and Tribes. Some of the cultural value associated with these properties cannot be fully mitigated; therefore, it is anticipated that residual impacts to these properties would occur.

Accidental disturbance, vandalism, and illegal collecting of artifacts would be expected to increase as a result of increased access.

3.11.6.8 Impacts to Cultural Resources from the No Action Alternative

Under the No Action Alternative, the proposed facilities that would comprise the Project would not be developed. No additional ground-disturbance would occur. Potential direct, indirect, and visual effects to historic properties, including TCPs and properties of traditional religious and cultural importance to Native Americans, located within the APE or within the viewshed of the Project would not occur.

3.11.6.9 Irreversible and Irretrievable Commitment of Resources

Historic properties (including TCPs and other properties of tribal importance) could be irreversibly and irretrievably lost if inventory, avoidance, and/or mitigation efforts are not sufficient to identify and protect these properties.

3.11.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

The Project would result in the loss of short-term use and long-term productivity of cultural resources not eligible for the NRHP and located in proposed disturbance areas. For historic properties (including TCPs and other properties of tribal importance) located in proposed disturbance areas that cannot be avoided, data recovery or other forms of mitigation would be conducted prior to construction. Mitigation of impacts to TCPs and other properties of tribal importance would be developed in consultation with interested Tribes. The scientific information obtained through data recovery would be preserved for the long term. However, the site itself ultimately would be lost. There would be a long-term loss of cultural resources due to illegal collecting and vandalism associated with increased human activity in, and access to, the analysis area.

3.12 Visual Resources

This section describes the affected environment and impact assessment based on construction, operation, and maintenance of the Project in each of the four geographic regions. Visual resources are defined as the visible features of the landscape. The affected environment and impact assessment were focused within a 5-mile visual study corridor for non-forested landscapes and a 20-mile corridor for forested landscapes centered on the reference line for each alternative route under consideration within this EIS. The affected environment and impact assessment methodology, including the locations of key observation points (KOPs), was developed and approved in consultation with the BLM and USFS. **Appendix I** contains details that support this section, and **Figure I-1** depicts the Project viewshed and KOP locations.

3.12.1 Regulatory Background

3.12.1.1 Federal Land Policy and Management Act as amended

The FLPMA of 1976 (90 Stat. 2743; 43 U.S.C. 1601, et seq.) established BLM as the jurisdictional agency for expanses of land in the West to be managed as multiuse lands. The following sections of the FLPMA relate to the management of visual resources on federal lands:

> § 102(a): "The public lands [shall] be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values."
>
> § 201(a): "The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including…scenic values)."
>
> § 202(c)(1-9): "...in developing land use plans, the BLM shall use…the inventory of the public lands; consider present and potential uses of the public lands, consider the scarcity of the values involved and the availability of alternative means and sites for realizing those values; weigh long-term benefits to the public against short term benefits."
>
> § 505(a): "Each right-of-way shall contain terms and conditions which will … (ii) minimize damage to the scenic and esthetic values" (BLM 2001).

3.12.1.2 BLM Resource Management Plans

The BLM manages land under its jurisdiction according to the goals and policies outlined in the RMPs. VRM classifications are developed by BLM based on landscape character, scenic quality, sensitivity levels, distance zones, and management direction as outlined in BLM Manual H-8410 (BLM 1986). Each of four VRM classes has an objective that prescribes the amount of change allowed in the characteristic landscape, ranging from Class I-no change to Class II-minor change, Class III-moderate change, and Class IV-major change (BLM 1986). Compliance with VRM classes is determined by comparison of the objective of the applicable class with the effects of the Project.

3.12.1.3 National Forest Land and Resource Management Plans

The LRMP guides all natural resource management activities and establishes management standards and guidelines for scenery within the national forests. The LRMP outlines SIOs and VQOs which prescribe the level of visible change allowable within forest boundaries. Scenic Classes are determined based on distance zones, concern level, and existing scenic integrity and managed to ensure that changes and development fit with existing type, form, line, color, and texture (USFS 1996). The five SIO or VQO categories are: Very High (unaltered-Preservation VQO), High (appears unaltered-Retention VQO), Medium (appears slightly altered-Partial Retention VQO), Low (moderately altered-Modification VQO), and Very Low (highly altered-Maximum Modification VQO) (USFS 1996). Consistency with SIOs and VQOs is

determined by comparison of the objective or integrity level of the applicable VQO or SIO, respectively, with the effects or alteration caused by the Project.

3.12.1.4 National Trails System Act

National Trails were established under the National Trail System Act of 1968 (16 U.S.C. §1241-51), designating and protecting national scenic trails, national historic trails, and national recreational trails. National trails are administered by BLM, the NPS, and the USFS; these agencies provide coordination and oversight for the entire length of a trail. However, as these trails traverse both public and private lands as well as lands controlled by various agencies, on-site management activities are performed by the jurisdictional agency, the state, or the landowner (NPS 2008).

3.12.1.5 National Historic Preservation Act

The NHPA includes language protecting the visual integrity of sites listed or eligible for the National Register of Historic Places: "Examples of adverse effects…include…introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features…" (36 CFR Part 800.5). Impacts to visual resources protected by the NHPA are discussed in Section 3.11, Cultural Resources and Native American Concerns.

3.12.2 Data Sources

3.12.2.1 Visual Resource Inventory

Existing VRIs were available for BLM lands. The landscape scenery and sensitive viewer inventory and mapping are unavailable for private and state lands in the project area or for the Ashley National Forest, Fishlake National Forest, Manti-La Sal National Forest, and Uinta National Forest. The inventory report for the Dixie National Forest was prepared for purposes of the Sigurd-Red Butte Transmission Project (2010) and obtained for the Project from the USFS. The methodology used to establish landscape scenery and sensitive viewers inventory and mapping for the Project included hand-digitizing from detailed aerials, data download from USGS and ReGap, GIS spatial analyses and field verification.

Localized physiography and land surface forms mapping (*New Map of Standardized Terrestrial Ecosystems of the Conterminous United States* [USGS, 2009]) was used to delineate landscape scenery rating units for the landscape scenery inventory. These scenery quality rating units were evaluated based on landform, water, vegetation, geology, land use and land cover sources, including Northwest and Southwest ReGap, and digital terrain data.

Sensitive viewers' locations, including residences and recreation sites, were hand-digitized in all areas within a 10-mile corridor. Navigable waterways, trails, and roads were included in the inventory.

Project-specific visibility and distance zone analyses and mapping were conducted in GIS (ArcGIS).

<u>Landscape Scenery</u>

Landscape scenery for the Project portrays the aesthetic value of landscapes on BLM, private, state and USFS lands. Scenic quality is defined by the BLM as the visual appeal of a tract of land (BLM 1986). BLM lands are rated Class A, Class B, and Class C, for highest to lowest scenic quality. Scenic attractiveness is defined by the USFS as the intrinsic scenic beauty of the landscape in a particular landscape character (USFS 1995). USFS lands are rated Class A-Distinctive, Class B-Common, and Class C-Indistinctive, for highest to lowest scenic attractiveness. Please see **Appendix I**, **Table I-1** for milepost locations and **Figure I-2** for map locations of Class A, B, and C scenery on BLM lands, for Class A-Distinctive, Class B-Common, and Class C-Indistinctive scenery on USFS lands, and for Class A-High, Class B-Medium, and Class C-Low in private lands. Scenic quality ratings were conducted at a 10-mile corridor-specific scale for USFS (with exception of Dixie National Forest), state, and private lands (**Appendix I, Table I-1** and **Appendix I**, **Figure I-3**), employing methods similar to the inventory systems of the BLM and USFS.

View distance, vegetation, topographic slopes, and characteristic landscape (particularly, the presence or absence of existing cultural modifications), play important roles in the assessment of change caused by the Project on landscape scenery.

Sensitive Viewers

Sensitive viewers' analysis and mapping for the Project encompasses public and private viewer's concern for landscape scenery. Sensitivity levels are defined by the BLM as the measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels (BLM 1986) (**Appendix I**, **Table I-2**). The USFS's constituent analysis is similar in intent. Constituent analysis leads to a determination of the relative importance of aesthetics to the public; this importance is expressed as a concern level. Sites, travelways, special places, and other areas are assigned a Concern Level value of 1, 2, or 3 to reflect the relative High, Medium, or Low importance of aesthetics (USFS 1995). Please see **Appendix I**, **Table I-3** and **Table I-4** for locations by alternative, segment, and milepost for High Sensitivity and Moderate Sensitivity Viewers, and **Appendix I, Figure I-4** for locations of mapped sensitivity levels.

View distance plays an important role in the assessment of change caused by the Project on sensitive viewers.

Distance Zones

Distance zones are defined by the BLM as relative visibility from travel routes or observation points. The three zones are foreground-middleground, background, and seldom seen. All BLM Field Offices' visual resource inventories show all distance zones as foreground-middleground throughout the field office. The foreground-middleground zone includes areas seen from highways, roads, trails, rivers, or other viewing locations that are less than 3 to 5 miles away. Seen areas beyond the foreground-middleground zone, but usually less than 15 miles away, are in the background zone. Areas not seen (hidden from view) in the foreground-middleground or background are designated as seldom-seen (BLM 1986). The USFS approach applies seen areas and distance zones as mapped from 1, 2, or 3 concern level areas to determine the relative sensitivity of scenes based on their distance from an observer; these zones are identified as foreground (up to 0.5 mile from the viewer), middleground (up to 4 miles from the foreground), and background (4 miles from the viewer to the horizon) (USFS 1995).

The distance and visibility analyses for the Project are based on visibility factors of the TWE structures, conductors, and ROWs and divided into four zones as follows: 1) immediate foreground (0 to 0.5 mile); foreground (0.5 to 2.5 miles); middleground (2.5 to 5.0 miles); and background (greater than 5 miles). These distances and viewsheds are integral to the Viewer Sensitivity analyses and shown in **Appendix I**, **Figures I-5** and **I-6** and **Appendix I, Tables I-3** and **I-4** for milepost information based on distance zones.

Visual Resource Inventory Classes

VRI classes represent the relative value of the visual resources and provide the basis for considering visual values in the resource management planning process. VRI Classes II, III, and IV are determined based on a combination of scenic quality, sensitivity level, and distance-zone overlays. Class II has a higher level of value than Class III, which is moderately valued. Class IV is least valued. A fourth VRI class, Class I, is assigned to special management areas. This includes Wilderness Areas or Wilderness Study Areas, Wild and Scenic Rivers, National Recreation Areas and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape. Please see **Appendix I**, **Table I-5** for VRIs by alternative, segment and milepost, and **Appendix I**, **Figure I-7** for map locations of VRI classes.

3.12.2.2 Agency Management Objectives and Local Planning

The RMP land use planning process results in VRM class assignments for all BLM-administered lands. The recent visual resource inventories have not yet been included in the BLM RMPs. VRM classes

(**Table 3.12-1**) are based on visual resource inventories and management decisions that must take into consideration the value of visual resources. Please refer to **Appendix I**, **Table I-6** for VRM locations by alternative, segment, and milepost.

Table 3.12-1 BLM Visual Resource Management Class Objectives

Class I Objective	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II Objective	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic (design) elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III Objective	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV Objective	The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic (design) elements.

Source: BLM 1986.

SIOs (**Table 3.12-2**) establish limits of acceptable human alteration in form, line, color, and texture as the landscape moves toward a landscape character goal. SIOs are assigned for all USFS-administered lands through the national forest planning process. However, the forest plans in the Project area have not yet been updated with scenic integrity objectives. With exception of the Dixie National Forest, the forest plans do include VQOs, which predate the current SIOs. These objectives are based on visual inventories and management decisions made in forest plans, which must take into consideration the value of scenery. At present, the Dixie National Forest and Fishlake National Forest have established SIOs, and the Ashley National Forest, Manti-La Sal National Forest, and Uinta National Forest have VQOs.

Table 3.12-2 USFS Scenic Integrity Objectives

Very High (SIO) or Unaltered-Preservation (VQO)	Very high scenic integrity refers to landscapes where the valued landscape character "is" intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.
High (SIO) or Appears Unaltered-Retention (VQO)	High scenic integrity refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
Moderate (SIO) or Slightly Altered-Partial Retention (VQO)	Moderate scenic integrity refers to landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Low (SIO) or Moderately Altered-Modification (VQO)	Low scenic integrity refers to landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed, but also compatible or complimentary to the character within.

Table 3.12-2 USFS Scenic Integrity Objectives

Very Low (SIO) or Highly Altered-Maximum Modification (VQO)	Very low scenic integrity refers to landscapes where the valued lands appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside landscape being viewed. However deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Source: USFS 1995.

Refer to **Appendix I**, **Table I-7** for SIO and VQO locations by alternative, segment, and milepost, and **Appendix I**, **Figure I-8** for map locations of visual resource management classes and scenic integrity objectives or visual quality objectives.

3.12.3 Analysis Area

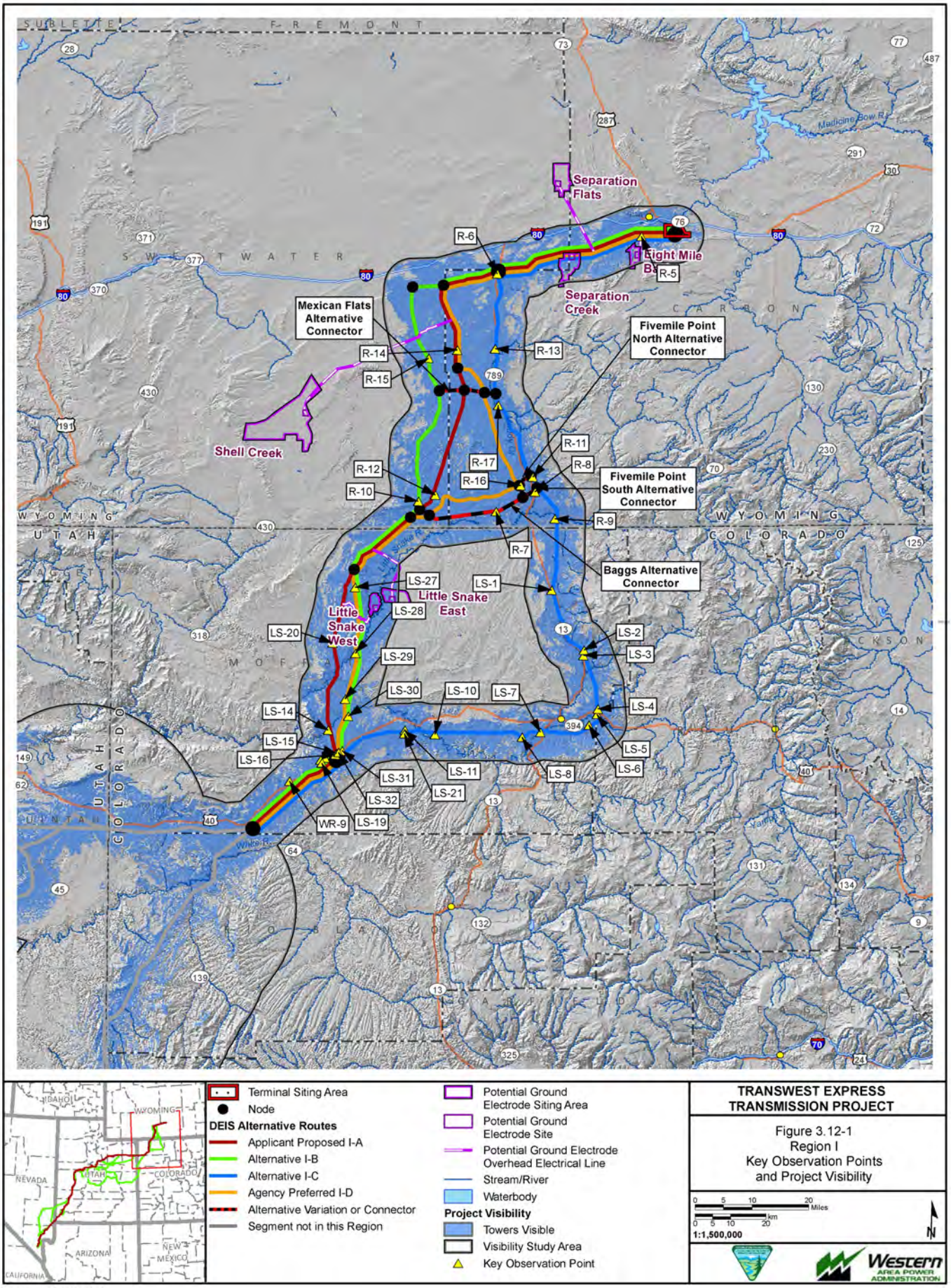
The analysis area is comprised of the viewsheds of the Project's reference lines out to 20 miles in locations where they cross tree-covered landscapes and out to 5 miles in shrub, grassland, and cropland landscapes. The difference in the two distances is based on visibility of cleared vegetation in ROWs in forested landscapes (20 miles) versus the visibility of only the transmission line structures and conductors (5 miles) in locations with no requirement for clearing of trees. Please see **Figures 3.12-1** through **3.12-4** for extents of the analysis area and the Project (also depicted in **Appendix I**, **Figure I-1**).

3.12.4 Baseline Description

Locations, natural features, and cultural elements of Physiographic Provinces surrounding the Project are depicted in **Appendix I** as **Figure I-9**. Detailed listings, by region and segment, of public places, roads, historic trails, towns, scenic overlooks, rivers, recreational sites and areas, and designated scenic byways and backways, within 0.5 mile (immediate foreground viewshed) of the Project are located in each regional impact section.

3.12.4.1 Developed and Natural Settings

The majority of the Project would cross developed landscapes. **Appendix I**, **Figure I-10** shows the Project's reference lines and developed and natural settings. Forty-three percent (1,082 miles) of the Project reference lines (2,502 miles) are located within one/half mile of one or more existing electrical transmission lines. **Appendix I**, **Table I-8** shows this information by milepost. **Appendix I**, **Table I-9** shows the visual contrasts of the Project's guyed and self-supported structures in connection with existing transmission line structures. Other human-made developments situated in close proximity to the Project include agricultural fields and structures, commerce, oil and gas developments, pipeline rights-of-way, railroads, industrial, residences, and roads. Portions of the Project traverse natural landscapes in viewsheds that contain little development beyond roads or trails. These include: the Cedar Breaks Draw (Segment 120) and Colloid Draw (Segment 115.07) viewsheds and Muddy Creek viewsheds (Segments 140, 140.05, and 190) northwest and north, respectively, of Baggs in Wyoming; the Sand Wash Basin (Segment 180.2), Seven Mile Ridge (Segment 180.2 and 186), Little Snake River (Segments 180.2 and 186), Nine Mile Basin (Segment 186), Peck Mesa (Segments 180.2 and 186), and portions of the Yampa River/Cross Mountain (Segments 180.2 and 186) viewsheds west of Craig and Davis Canyon and Texas Creek viewsheds (Segment 220.1) north of Baxter Pass in Colorado; the Nine Mile Canyon, Electric Lake,



Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Stream/River
Waterbody
Project Visibility
Towers Visible
Visibility Study Area
Key Observation Point

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Figure 3.12-1
Region I
Key Observation Points and Project Visibility

0 5 10 20 Miles
0 5 10 20 km
1:1,500,000

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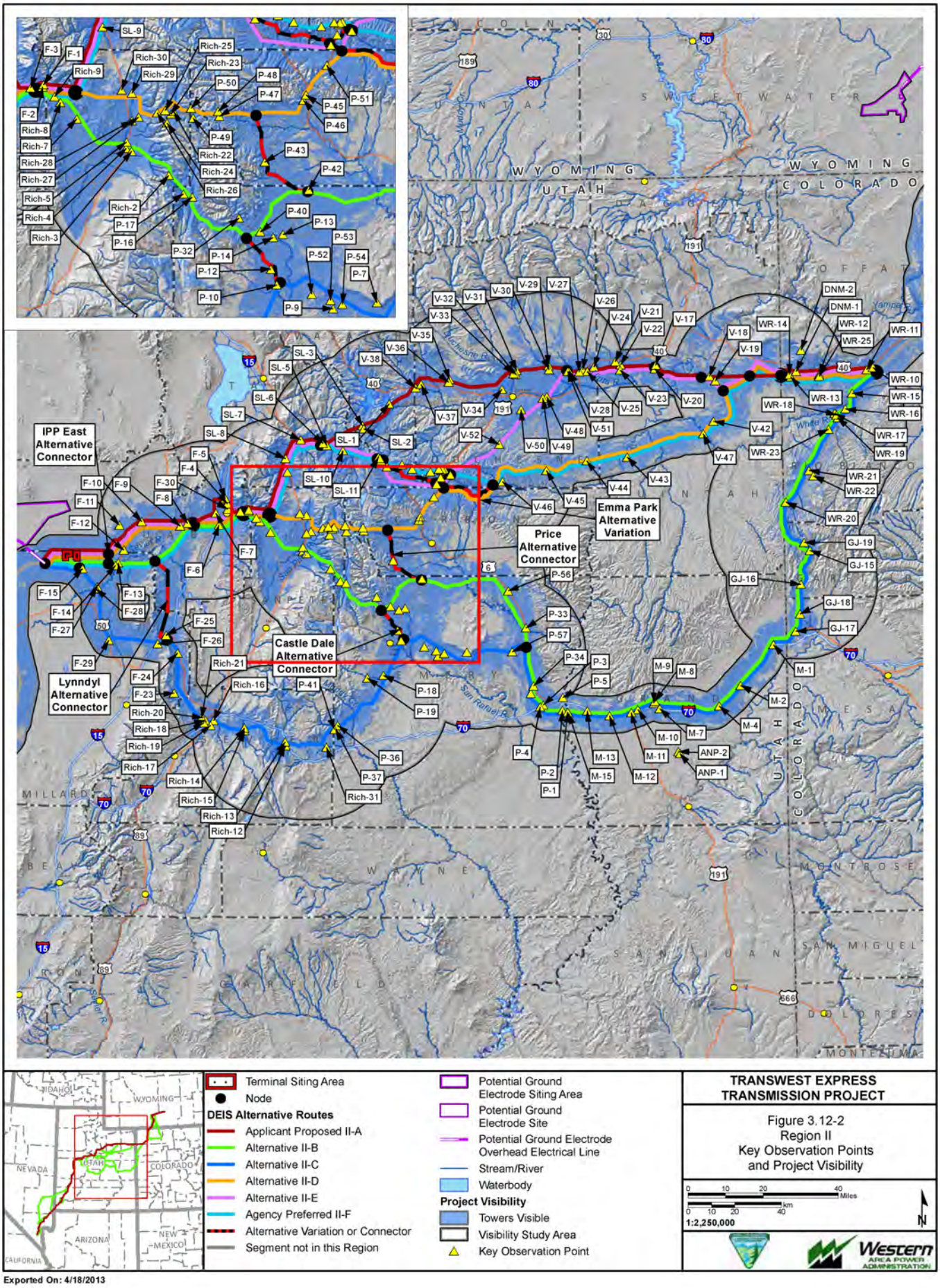

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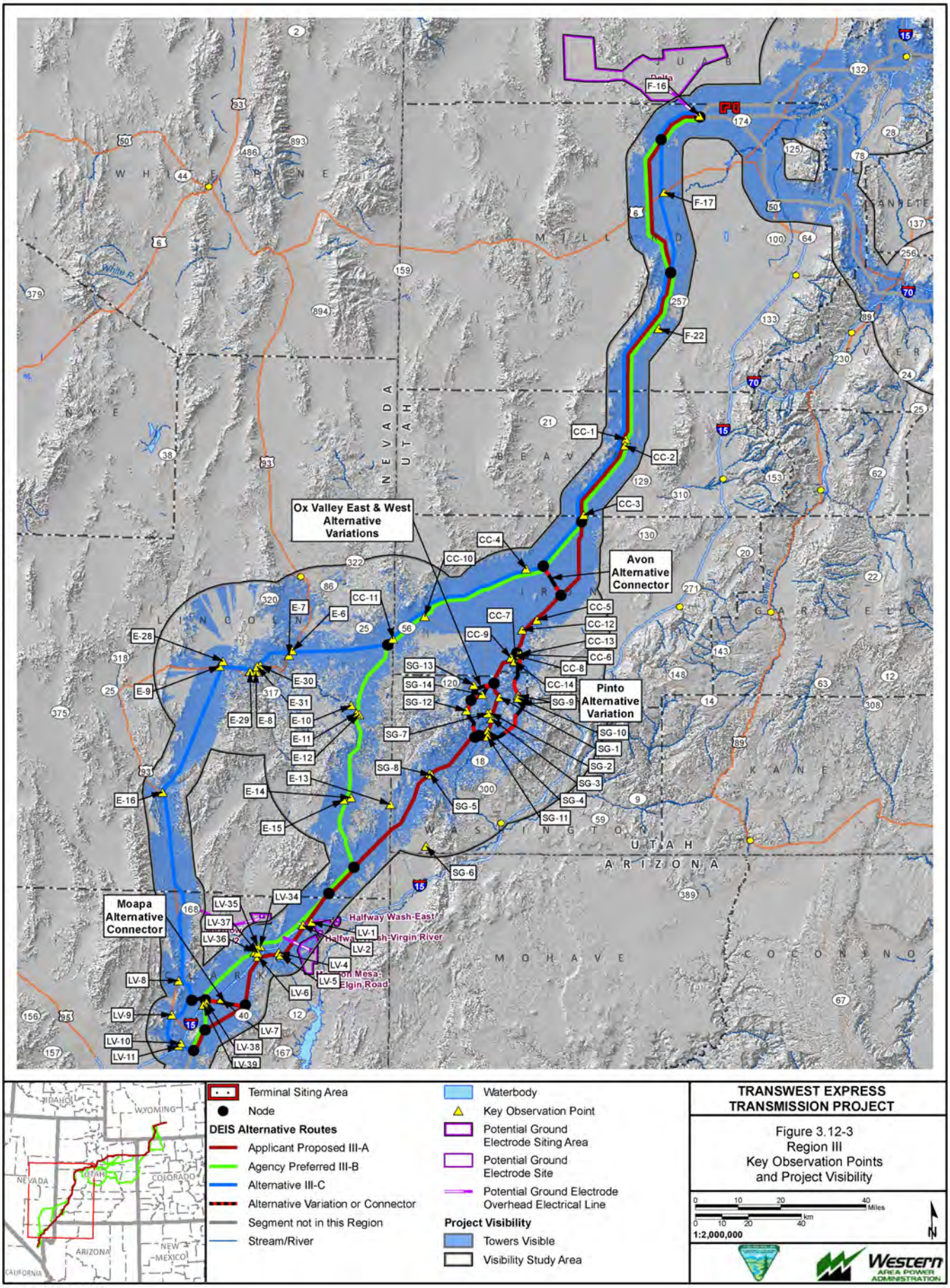

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Figure 3.12-3
Region III
Key Observation Points and Project Visibility

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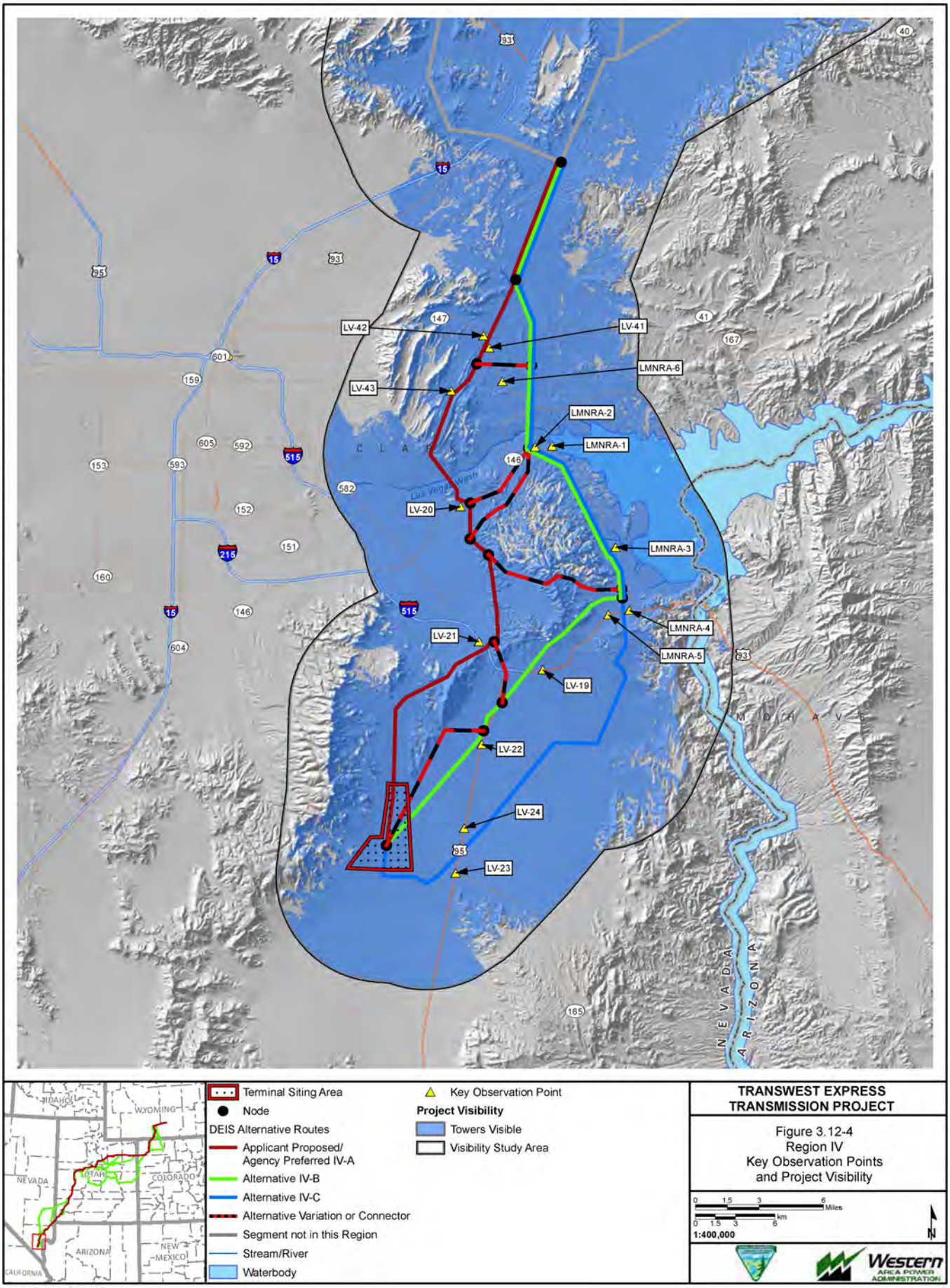

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and Fairview Canyon viewsheds (Segment 217.15), Cisco Desert viewsheds (Segment 220.1), Dry Mesa and Chimney Rock viewsheds (Segment 225.2), Ox Valley viewsheds (Segment 505), and Pinto viewsheds (Segment 506) in Utah; all of the viewsheds, including those of the Silver State Trail (Segments 520) and Rainbow Backcountry Byway (Segment 510) north, west, east, and southeast of Caliente in Nevada; and the Rainbow Gardens viewshed (Segment 660) between Lake Mead National Recreation Area and Henderson, Nevada.

3.12.5 Regional Summary

The Project's setting intersects the high plains, mountains, plateaus, valleys, and desert landscapes of Wyoming, Colorado, Utah, and Nevada, respectively. Landscape character is identified and described by the combination of the scenic attributes that make each landscape identifiable or unique. A region's landscape character creates a "Sense of Place," and describes the visual image of an area. The Study area's landscape character is defined by the landforms, vegetation, water, and cultural features of the following physiographic provinces (Fenneman 1931): Wyoming Basin Province, Uinta Basin section of the Colorado Plateaus Province, Northern Canyonlands section of the Colorado Plateaus Province, Middle Rocky Mountains Province, High Plateaus of Utah section of the Colorado Plateaus Province, Great Basin section of the Basin and Range Province, and Sonoran Desert section of the Basin and Range Province.

3.12.5.1 Wyoming Basin Province (Region I)

The Wyoming Basin Province is intersected by the Project in northwestern Colorado and southern Wyoming. Project jurisdictions include the Little Snake FO and Rawlins FO. The characteristic landscape is typified by a broad, open plain interrupted by linear escarpments, rolling hills and low mountains. Elevation ranges from 6,000 to 8,000 feet. Vegetation types are mostly grass, sage, rabbit brush, and greasewood with juniper and pinyon pine on higher-elevation slopes. Riparian vegetation, especially cottonwood and willow, is common along the Yampa River and the Little Snake River. These are both recreation rivers. Cultural features in the analysis area include the National Historic Old Cherokee Trail, Continental Divide Trail, Lincoln Highway, and National Historic Overland Trail. Baggs, Craig, Maybell, Rawlins, Sinclair, and Wamsutter are viewer population centers. Major roads with viewing opportunities are Interstate 80, Wyoming SH 70 from Baggs to Encampment, Wyoming SH 789 from Baggs to I-80, U.S. 40, Colorado State Highways 13 and 395, and numerous recreational BLM and county roads. Designated scenic roads include the Battle Scenic Highway from Baggs to Encampment; the Outlaw Trail Scenic Highway from Baggs to I-80; and the Dinosaur Diamond National Scenic Byway from Vernal to I-70.

3.12.5.2 Uinta Basin Section of the Colorado Plateaus Province (Region I and Region II)

The Uinta Basin Section of the Colorado Plateaus Province is intersected by the Project in western Colorado and northern Utah. Project jurisdictions include the Little Snake FO, Salt Lake FO, Vernal FO, White River FO, Ashley National Forest, and Uinta National Forest. The characteristic landscape is defined by low mountains, rolling hills, and broad valleys. Elevation ranges from 6,200 to 7,300 feet. Vegetation types include juniper-pinyon woodlands and saltbush-greasewood and grasslands-shrubs with big sagebrush. Dinosaur National Monument's lower visitor center and middle and upper scenic overlooks are within the viewshed of the analysis area. Major recreational rivers include the Green River, Duchesne River, Strawberry River, and Currant Creek. Water-related recreational facilities include the Bottle Hollow Reservoir, campground, and boat launch; San Rafael River boat launch and overlook; and Starvation Reservoir, campground, beach, and boat launch. Cultural features in the Project area consist of Dinosaur, Duchesne, Roosevelt, and Vernal, which are major viewer population centers. Major roads with viewing opportunities include Colorado SH 64, Utah SH 35, Utah SH 45, Utah SH 87, Utah SH 88, and Utah SH 208. Designated scenic roads include Brown's Park Road Scenic Backway; Dinosaur Diamond Scenic Byway/U.S. Highway 40; and Jones Hole Road Scenic Backway.

3.12.5.3 Northern Canyonlands Section of the Colorado Plateaus Province (Regions I and II)

The Northern Canyonlands Section of the Colorado Plateaus Province is intersected by the Project in western Colorado and eastern Utah. Project jurisdictions include the Grand Junction FO, Moab FO, and Price FO. The characteristic landscape is defined by steep, sheer-walled canyons, canyonlands, linear cliffs, low plateaus, mesas, buttes, and badlands. The region's major landforms are the San Rafael Swell and Book Cliffs and overall elevation ranges from 4,200 to 12,700 feet. Vegetation types are blackbrush, juniper-pinyon woodlands, saltbush-greasewood, and shrub steppe. The Colorado River and Green River are major visual and recreational destinations of the region. Cultural features in the analysis area consist of numerous pictograph sites. Viewer population centers include Green River, Thompson Center, and Ferron. The Huntington Lake State Park, beach, and campground is located within view of the Project. Major roads with viewing opportunities include I-70, U.S. 6, Utah SH 10, Utah SH 31. Designated scenic roads include: Dinosaur Quarry-Cedar Overlook Scenic Backway; Energy Loop-Huntington-Eccles Canyons Scenic Byway; Wedge Overlook-Buckhorn Drive Scenic Backway; and Old Railroad Grade/pictograph access.

3.12.5.4 Middle Rocky Mountains Province (Region II)

The Middle Rocky Mountains Province is intersected by the Project in western Colorado and northern Utah. Project jurisdictions include the Little Snake FO, Richfield FO, Salt Lake FO, Vernal FO, and Ashley National Forest, Manti-La Sal National Forest, and Uinta National Forest. The characteristic landscape is defined by steep mountains and inclined to flat valleys, with elevations ranging from 5,000 to 8,000 feet. Vegetation types include the spruce-fir, aspen and ponderosa pine, mountain shrub, valley grassland, and riparian communities. Recreational features in the analysis area consist of the Indian Creek and Potters Ponds Campgrounds and recreational facilities associated with Cleveland Lake, Electric Lake, Fairview Lakes, Huntington Reservoir, and Joe Reservoir. Major roads with viewing opportunities include U.S. Highway 6, U.S. Highway 87, Utah SH 31, Utah SH 264, and Utah 764. Designated scenic roads include the Skyline Drive Scenic Backway and Strawberry-White River Scenic Backway.

3.12.5.5 High Plateaus of Utah Section of the Colorado Plateaus Province (Region II)

The High Plateaus of Utah Section of the Colorado Plateaus Province is intersected by the Project in central Utah. Project jurisdictions are the Richfield FO, and Fishlake National Forest, and Manti-La Sal National Forest. USFS campgrounds and recreational locations in the affected environment include the Maple Grove Campground and Scipio Lake. Viewer population centers include Aurora and Mount Pleasant. Major roads with viewing opportunities include I-70, U.S. 89, U.S. 50, and numerous recreational roads. Designated scenic roads include the Gooseberry-Fremont Road Scenic Backway, Skyline Drive Scenic Backway, and Bitter Springs Backcountry Byway.

3.12.5.6 Great Basin Section of the Basin and Range Province (Region II and Region III)

The Great Basin Section of the Basin and Range Province is intersected by the Project in western Utah and eastern Nevada. Project jurisdictions include the Cedar City FO, Caliente FO, Fillmore FO, Las Vegas FO, Richfield FO, and St. George FO, and Dixie National Forest, Fishlake National Forest, and Manti-La Sal National Forest. The characteristic landscape is defined by steep mountain ranges and wide, flat valleys. Elevation ranges from 3,000 to 10,000 feet. Vegetation types are sagebrush, juniper-pinyon woodlands, dwarf-cedar, mountain mahogany, and saltbush-greasewood. The towns of Caliente, Central, Enterprise, Newcastle, and Pinto represent viewer population centers. Recreational viewer locations include the Little Sahara Recreation Area and Newcastle Reservoir. Cultural features include the Antelope Springs-Old Spanish Trail and Mountain Meadows Massacre Site and Overlook. Major roads with viewing opportunities include I-15, U.S. 50, U.S. 93, U.S. 95, U.S. 93/95, Nevada SH 40, Nevada SH 55, Nevada SH 147, Nevada SH 168, Nevada SH 319, Utah SH 18, Utah SH 21, Utah SH 56, Utah SH 100, Utah SH 132, Utah SH 174, and Utah SH 257. The Silver State Trail is crossed by the Project and its trailheads are located within the Project's immediate foreground viewsheds. Designated scenic roads include the Mojave Desert-Joshua Tree Scenic Backway and Rainbow Backcountry Byway.

3.12.5.7 Sonoran Desert Section of the Basin and Range Province (Region IV)

The Sonoran Desert Section of the Basin and Range Province is intersected by the Project in southern Nevada. The Project jurisdiction is the Las Vegas FO. The characteristic landscape is defined by steep, arid, widely separated short mountain ranges in desert plains, fans, and terraces. Elevation ranges from 300 to 3,500 feet. Lake Mead is the major water formation in the region and the McCullough Mountain Range, Highland Range, and Eldorado Valley are the major landforms. Vegetation communities include palo verde, creosote bush, saguaro, mesquite series, and bursage. The Colorado River is the major visual and recreational destination in the region. Cultural features in the analysis area include the National Historic Old Spanish Trail. Lake Mead, Lake Mead National Recreation Area, and Valley of Fire State Park are major recreational viewing opportunity areas. Viewer population centers include Boulder City, Henderson, and Las Vegas. Numerous recreational roads, recreational sites, and hiking trails are associated with these communities and recreation areas. Roads with viewing opportunities include U.S. 93, U.S. 95, U.S. 93/95, Nevada SH 146, Nevada SH 147, Nevada SH 166, and Nevada SH 582.

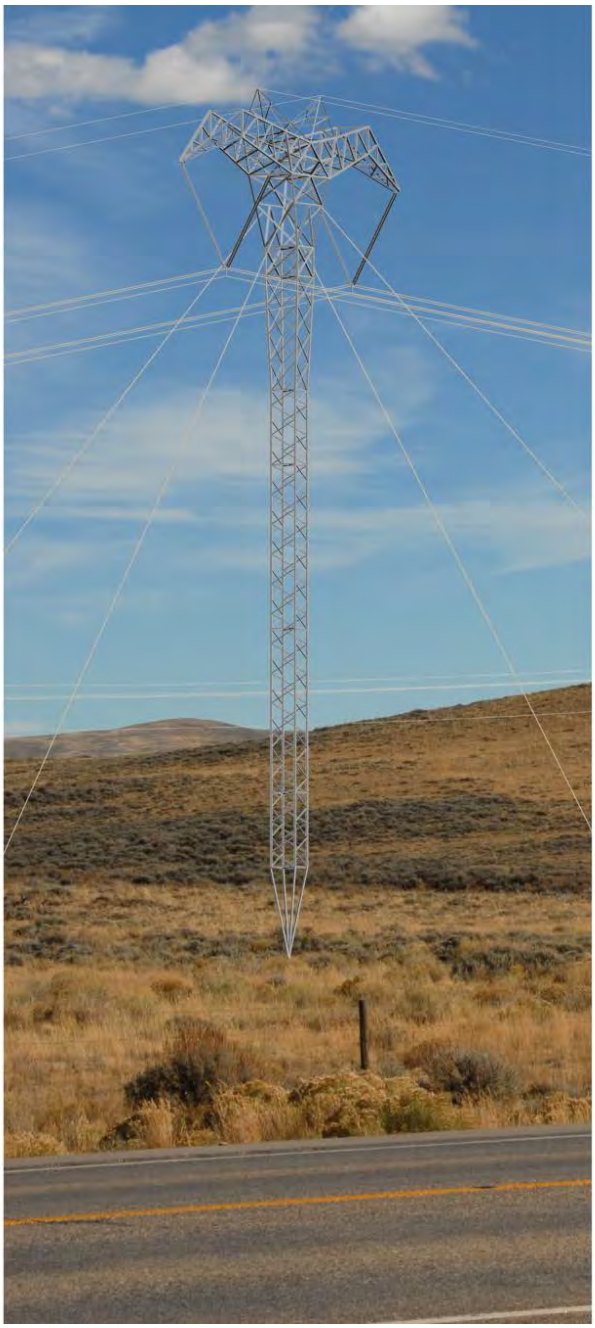
3.12.6 Impacts to Visual Resources

Potential impacts to visual resources were identified through BLM and USFS consultation and public scoping. These include potential impacts to people (the viewing public), impacts to scenery, and compliance with BLM visual resource management objectives or consistency with USFS scenic integrity or visual quality objectives.

Visual resources impacts would occur during the construction phase of the project and be caused by vegetation clearing within the ROW and ground disturbance for access roads, transmission line, terminal, and electrode bed construction. Impacts would continue into the operational phase with visibility of structures, overhead conductors, cleared ROWs in tree-covered landscapes, access roads, terminal areas, and electrode bed areas and associated roads and small voltage (nn-kV) electrical lines. Visible elements would be steel lattice guyed towers (with four guy wires), and/or tubular pole towers, steel lattice free-standing towers, up to 180 feet in height, two sets of three (bundled) electrical conductors, not less than 38 feet above the ground, and two shield wires connecting the tops of the towers. The guyed towers are constructed along tangents (straight lines) of the ROW at 1,200- to 1,500-foot spans and the free-standing towers are constructed at the points-of-intersection (angles) and any spans greater than 1,500 feet. This latter detail becomes a compliance issue when applying mitigation **VR-3** (see Section 3.12.6.3), due to the need to replace guyed structures with self-supporting structures for spans greater than 1,500 feet. The larger, more contrasting self-supported structures increase visual impact. Impacts of the decommissioning phase would be similar to those of construction. A Visual Resources Mitigation Plan would be developed prior to construction and will include plans to address specific impacts.

Figure 3.12-5 portrays the visible features of guyed steel lattice (left-hand image) and self-supporting steel lattice (right-hand image) transmission line structures. **Figures 3.12-6** and **3.12-7** portray the comparisons of guyed, self-supporting, and tubular pole structures at 0.25 mile, 0.5 mile, 1 mile, and 2 miles with sky as background and landforms as background, respectively. Nine standard BLM criteria for determination of visual contrasts are analyzed for the two structure types in the tables in **Appendix I**.

Construction and operation phase impacts from any needed access roads are considered along with vegetation clearing of the 250-foot ROW. An Access Road Plan would be developed for the Agency Preferred Alternative during final engineering and design, which would define site-specific access to each structure and temporary work area and would be included as part of the COM Plan.



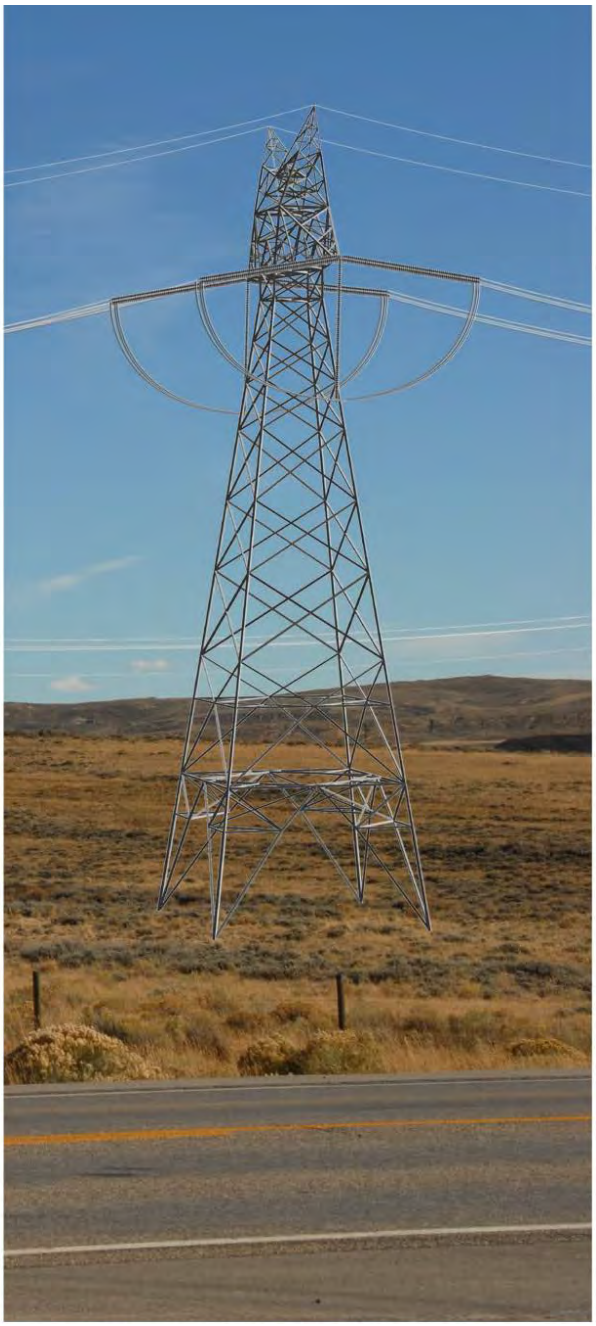


Figure 3.12-5 Guyed Steel Lattice (left) and Self-supporting Steel Lattice (Right) Transmission Line Structures

Figure 3.12-6 Comparisons of Guyed, Self-supporting, and Tubular Pole Structures at 2.0, 1.0, 0.5, and 0.25 miles with Sky as Background

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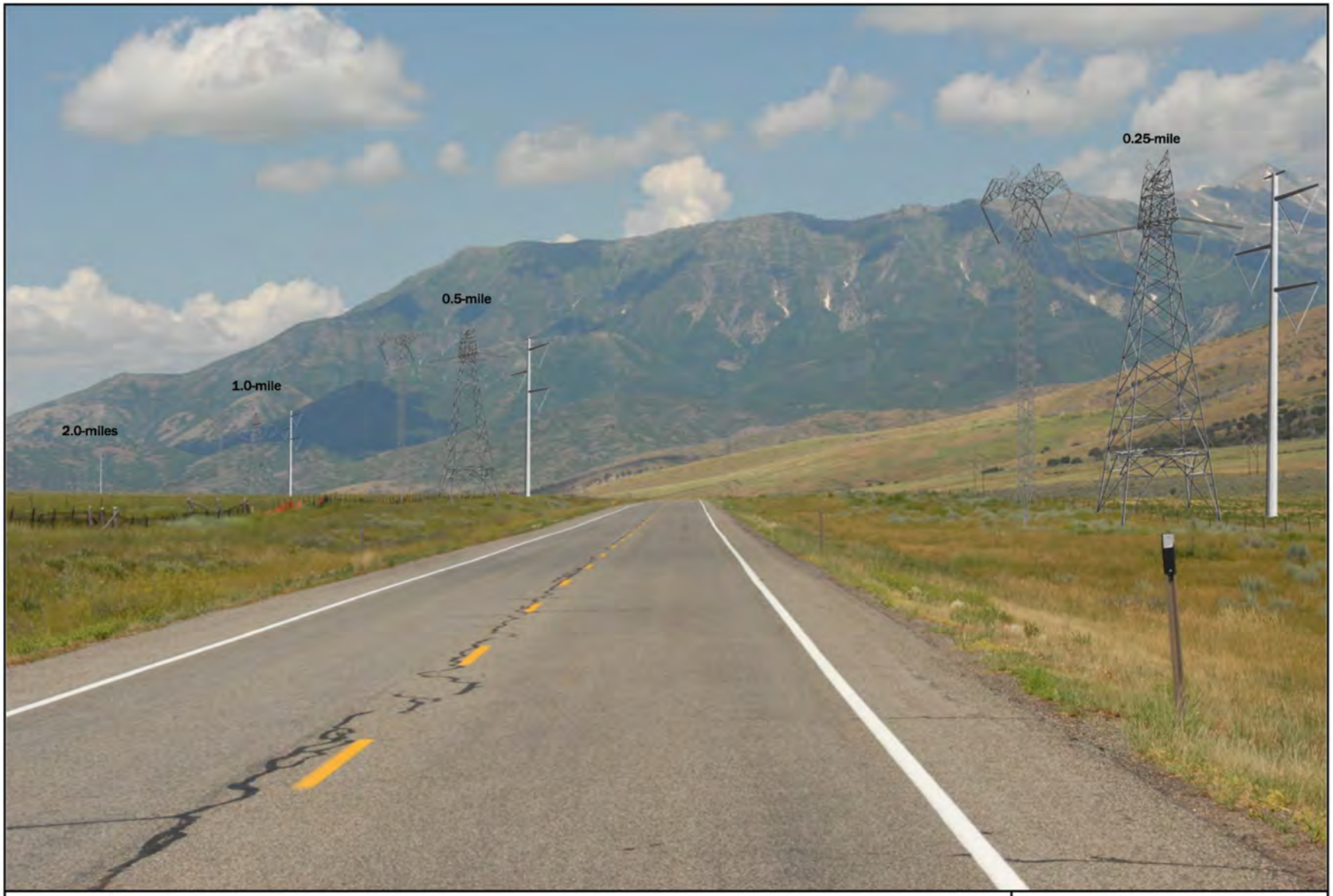

Figure 3.12-7 Comparisons of Guyed, Self-supporting, and Tubular Pole Structures at 2.0, 1.0, 0.5, and 0.25 miles with Landforms as Background

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Overall analysis considerations for visual resources are described in **Table 3.12-3**. The analysis of visual resources impacts is based on the assumptions that disturbance of people's views and changes in the scenic landscape are impact parameters. In addition, non-compliance or inconsistency with agency management objectives indicates impact significance. Steel transmission line structures and conductors create visual contrasts out to 5 miles in project landscapes, depending on sun-lighting conditions and relative viewer positions. Vegetation management, which includes tree removal in linear ROWs, exerts visual contrasts in views up to 20 miles in tree-covered landscapes. These contrasts remain until decommissioning and replanting or feathering of the ROW. Visual contrasts from vegetation management in landscapes without tree cover would remain until grasses and shrubs re-inhabit disturbed areas. These contrasts typically diminish within 3 to 5 years. **Appendix I**, **Table I-12** shows estimates of reclamation recovery time based on topographic slopes, topographic aspects, and vegetation cover.

Table 3.12-3 Analysis Considerations for Visual Resources

Topic	Analysis Considerations and Relevant Assumptions
Impacts to people (the viewing public).	Measure the extent of and describe the effects of the Project's structures and disturbed ROWs on people through spatial analysis of BLM's visual resource inventory sensitivity levels and distance zones, USFS viewer concern levels and distances, and viewer sensitivity levels on private, state, and other federal receptors (**Appendix I Tables**).
Impacts to the scenic landscape.	Measure the extent of and describe the effects of the Project's structures and disturbed ROWs on the scenic landscape through spatial analysis of BLM's visual resource inventory visual quality classifications, USFS scenic attractiveness ratings, and scenic quality on private, state, and other federal lands (**Appendix I Tables**).
Compliance or consistency with agency management objectives.	Apply the BLM's visual contrast rating process and forms for views from key observation points to describe the form, line, color, and texture of the characteristic landscape's landform/water, vegetation, and structures and the form, line, color, and texture of the Project's landform/water, vegetation, and structures. Compare the Project with the characteristic landscape to determine visual contrasts between proposed conditions and existing conditions (**Appendix I Tables**). Visual contrast determination includes application of BLM's nine standard criteria for assessing visual contrasts.

A significant impact to visual resources would result if any of the following were to occur from construction or operation of the proposed Project:

- Visually obvious degradation of the foreground character or scenic quality of a visually important landscape.
- Dominant visual changes in the landscape that are seen from highly sensitive viewer locations such as community enhancement areas (e.g., community gateways, roadside parks, viewpoints and historic markers) or locations with special scenic, historic, recreation, cultural, archaeological and/or natural qualities that have been recognized as such through legislation or some other official declaration.
- Impacts to visual resources that are not in compliance with the BLM VRM classifications and/or consistent with Forest Service SIO or VQO classifications.

3.12.6.1 Methodology

Study methods were developed in close coordination with, and direction from, the BLM and USFS and comply with policies of both agencies. The BLM provided visual resource inventories and resource management plans for each of the 15 FOs: Cedar City FO, Caliente FO, Fillmore FO, Grand Junction FO, Las Vegas FO, Little Snake FO, Moab FO, Price FO, Rawlins FO, Richfield FO, Rock Springs FO, Salt Lake FO, St. George FO, Vernal FO, and White River FO. The USFS provided scenic integrity objectives

or visual quality objectives and land management plans for each of the five national forests; Ashley National Forest, Dixie National Forest, Fishlake National Forest, Manti La-Sal National Forest, and Uinta National Forest. KOPs were selected based on visibility of the Project and through approval by each field office and forest. Please see **Figures 3.12-1** through **3.12-4** (Project Regions I through IV) for general locations of alternative routes, KOPs, and viewsheds of the Project. Please see **Appendix I**, **Figure I-1** for specific locations of KOPs, Project reference lines, mileposts, and viewsheds.

Impacts to landscape scenery were determined by measuring the extent of effects of the Project's structures, access roads, and disturbed ROWs on the scenic landscape through spatial analysis of BLM's visual resource inventory visual quality classifications, USFS scenic attractiveness ratings, and scenic quality on private, state, and other federal lands

Impacts to viewers were determined by measuring the extent effects of the Project's structures, access roads, and disturbed ROWs on people through spatial analysis of BLM's visual resource inventory sensitivity levels and distance zones, USFS viewer concern levels and distances, and viewer sensitivity levels on private (including residences), state, and other federal receptors.

Compliance or consistency with agency management objectives involves application of the BLM's visual contrast rating process forms for views from key observation points to describe the form, line, color, and texture of the characteristic landscape's landform/water, vegetation, and structures and the form, line, color, and texture of the Project's landform/water, vegetation, and structures. It also involves comparison of the Project with the characteristic landscape to determine visual contrasts between proposed conditions and existing conditions. Visual contrast determination includes application of BLM's nine standard criteria for assessing visual contrasts. For USFS lands, consistency with SIOs or VQOs involves the comparison of existing landscape integrity with integrity that would occur with implementation of proposed conditions. The presence of utility corridors or utility windows will take precedence over issues of compliance or consistency with agency management objectives.

Impact Parameters

Impacts were assessed by comparing the Project's visual contrasts with landscape scenery, sensitive viewers, and compliance and consistency with BLM and USFS visual management objectives, respectively. Existing transmission lines within 0.5 mile (immediate foreground) of the Project reference line are documented by segment and milepost in **Appendix I**, **Table I-8**. The visual contrasts (strong, moderate, and weak) between the Project's guyed or self-supporting transmission line structures' form, line, and color and existing structures' form, line, and color, within 0.5 mile, are documented in **Appendix I**, **Table I-9**.

The ten standard BLM criteria for determination of visual contrasts were interpreted for applicability for a transmission line and ancillary facilities project of the magnitude of TWE and reduced to nine criteria. The nine criteria are documented in **Appendix I**, **Table I-10** and listed as follows: 1) the distance between observer and Project; 2) length of time the project is in view (linear or stationary viewers – KOPs); 3) the angle of observation; 4) whether the structures and conductors are sun lit (brighter, lighter grays) or in shade (darker, less apparent grays); 5) the presence of guyed, steel lattice tangent structures or larger self-supported, steel lattice angle structures; 6) types of structures in view; 7) relative size or scale; 8) scenic or historic; 9) presence of residential; and 10) reclamation recovery time.

Landscape scenery impacts (**Table 3.12-4**) were determined based on the comparison of contrasts with the scenic quality inventory of the affected environment (**Appendix I**, **Figure I-11** and **Appendix I**, **Table I-11**). Segments were documented and mapped where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) as shown by milepost in **Appendix I**, **Table I-12**. The results are based on consideration of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, etc.), and the effect of introducing the Project into the landscape as either a new or additional

cultural modification. The range of scores for Class A scenery is 19 to 32 and 12 to 18 for Class B Scenery. The Class C scenery threshold is 11 or less. The most impactful score for a detracting cultural modification is minus four (-4). If there are existing cultural modification scores from minus one (-1) through minus four (-4), the effect of the Project would result in no less than a minus four (-4) in total. Thus, the range of possibilities for reducing Class A to Class B is based on an existing Class A score of 19 to 22 and for reducing Class B to Class C, 12 to 15.

Table 3.12-4 Landscape Scenery Impacts

Landscape Scenery Impacts			
	Project Visual Contrast		
Scenic Quality	**Strong**	**Moderate**	**Weak**
Class A	High	High	Moderate
Class B	High	Moderate	Low
Class C	Moderate	Low	Low

Sensitive viewers' impacts were determined based on the comparison of contrasts with sensitivity/user concern levels, distance zones (0 to 0.5 mile, 0.5 to 2.5 miles, 2.5 to 5 miles, and greater than 5 miles) (**Table 3.12-5**), and visibility of the Project (**Table 3.12-6**) (**Appendix I**, **Figures I-5** and **I-6**). The sensitive viewers' impact tables are located in the regional summaries (by Alternative) and Impacts sections (by alternative and segment) and shown by segment and milepost in **Appendix I**, **Table I-13** for high sensitivity viewers, and in **Appendix I**, **Table I-14** for moderate sensitivity viewers.

Table 3.12-5 Sensitivity Level/User Concern Impacts

High Sensitivity Level/User Concern Impacts			
	Project Visual Contrast		
Project Visibility	**Strong**	**Moderate**	**Weak**
0 – 0.5 Miles	High	Moderate	Moderate
0.5 – 2.5 Miles	Moderate	Moderate	Low
2.5 – 5 Miles	Moderate	Low	Low
Greater Than 5 Miles	Low	Low	Low
Medium Sensitivity Level/User Concern Impacts			
0 – 0.5 Miles	High	Moderate	Moderate
0.5 – 2.5 Miles	Moderate	Low	Low
2.5 – 5 Miles	Low	Low	Low
Greater Than 5 Miles	Low	Low	Low

Table 3.12-6 Distance Zones and Project Visibility

Distance Zones and Project Structures Visibility	
Distances	**Project**
Immediate Foreground	0 – 0.5 Miles
Foreground-Middleground	0.5 – 2.5 Miles
Background	2.5 – 5 Miles
Seldom Seen	Greater Than 5 Miles

Table 3.12-6 Distance Zones and Project Visibility

Distance Zones and Project ROW Visibility	
Immediate Foreground	0 – 0.5 Miles
Foreground-Middleground	0.5 – 5 Miles
Background	5 – 20 Miles
Seldom Seen	Greater Than 20 Miles

Compliance with BLM VRM objectives and consistency with USFS SIOs and VQOs was determined by comparison of objectives with visual contrast ratings from 309 KOPs and in High SIO and Retention VQO areas irregardless of the presence of KOPs. Mitigations **VR-1** through **VR-9** (see Section 3.12.6.3) are applied where appropriate and feasible to reduce impacts as much as possible and to identify location and level of residual impacts. The agency management objectives compliance and consistency tables are located in the regional summaries (by alternative) and Impacts sections (by alternative and segment) and in **Appendix I**, **Tables I-15**, **I-16**, and **I-17**. Visual impact levels are summarized in **Table 3.12-7**. BLM compliance or USFS consistency criteria are summarized in **Table 3.12-8**.

Table 3.12-7 Impact Level Criteria

Impact	Criteria
High	The project would be dominant in Class A or Class B landscape scenery. The project would be visible within 0.5 miles of high sensitivity or high user concern viewers.
Moderate	The project would be co-dominant in Class B landscape scenery. The project would be visible within 0.5 to 2.5 miles of medium sensitivity or medium user concern viewers. The project would parallel existing linear features such as roads or pipeline ROWs, or transmission line features at 1,500 feet or more.
Low	The project would be dominant or co-dominant in Class C landscape scenery. The project would be visible with greater than 2.0 miles of medium sensitivity or medium user concern viewers. The project would parallel and be co-dominant with existing transmission line features.

Table 3.12-8 BLM Compliance or USFS Consistency Criteria

VRM/SIO/VQO	Standard
No	The project would have a high or moderate contrast in areas with VRM Class II, SIO High, or VQO Retention management objectives. The project would have a high contrast in areas with VRM Class III, SIO Moderate, or VQO Partial Retention management objectives. The project would have a moderate contrast in areas with VRM Class III, SIO Moderate, or VQO Partial Retention management objectives.
Yes	The project would be in VRM Class IV, SIO Low, or Very Low, or VQO Modification or Maximum Modification.

In addition to the KOP-based compliance analyses of the BLM applied for consistency on USFS lands, analysis has been conducted in those areas of the national forests with High and Moderate SIO and areas of Retention and Partial Retention VQO crossed by the Project where the Project would be inconsistent with management objectives. Portions of the Project that include one or more existing transmission lines and ROW clearings would be fully consistent with the definition of a High and Moderate SIO or Retention and Partial Retention VQO because the landscape character is not intact and the introduction of strong

forms in the landscape would not deviate substantially from the existing character. Where the Project does not parallel an existing transmission line, it would not meet the definition of a High or Moderate SIO or Partial Retention VQO if located within 0.5 miles of the viewer, and more so, in moderate to steep terrain.

If the Project is located within a USFS-designated utility window or corridor, which allows for the construction and operation of transmission line projects, the SIO or VQO classification is negated.

Project Visibility

The visible height threshold for structures was set at 150 feet, the height of the tallest structures' crossarms. That threshold assumes that a person seeing at least the crossarms would perceive the presence of the Project. Permanent access roads were assumed to be 14 feet wide. The cleared ROW was assumed to be 250 feet wide. The ArcGIS viewshed application was used to determine visibility of the Project out to five miles where the reference line would be in shrub, grassland, and cropland landscapes and out to 20 miles where there would be cleared ROWs in forested landscapes.

Landscape character and scenic integrity for USFS lands crossed by the Project is described by alternative, segment, and milepost in **Appendix I**, **Table I-18**. Landscape character for BLM land (by Region and Alternative) is described at the scenic quality rating unit level by Segment and milepost in **Appendix I**, **Table I-19**.

3.12.6.2 Impacts from Terminal Construction and Operation

The Northern and Southern terminals would be constructed regardless of alternative route or design option.

Northern Terminal

The Northern Terminal would be sited on private land (BLM-private checkerboard), 3 miles south of I-80 and Sinclair, Wyoming, and would require initial disturbance of 504 acres for construction and long-term disturbance of 234 acres for operation. This location is in a largely undisturbed, flat area of sage brush and un-vegetated playa.

Due to limited visibility of the Project by the casual observer, impacts to people would be low. Due to diminished visual quality, impacts to Class B scenery would be moderate to high, which would lower the Scenic Quality rating in the immediate area (0.5 mile) to Class C scenery. Project elements would have moderate to strong contrast with the existing landscape. These contrasts would be due to cylindrical and pyramidal forms, vertical and horizontal lines of structures and conductors, silvery-grey and tan colors, smooth textures resulting from the structures of the terminal site, multiple guyed steel lattice structures along the tangent near the terminal site, wider, larger-appearing self-supporting steel lattice structures at the points-of-intersection, fences, and vegetation clearing for roads. Since the color of terminal materials would cause contrasts with the characteristic landscape and also emphasizes form, line, and texture contrasts of those materials, application of **VR-2** (see Section 3.12.6.3) through use of the BLM standard environmental colors (Standard Environmental Color Chart, CC-001, 2008) for the surfaces of terminal structures, tanks and fencing would mitigate contrasts to a weak to moderate level for the terminal in this landscape. Implementation of **VR-8** (see Section 3.12.6.3) lighting guidelines would reduce night-time glare to minimal levels.

Southern Terminal

The Southern Terminal would be sited on private land in the Eldorado Valley near Boulder City, Nevada, in an area that is already developed with numerous transmission lines, two substations and two solar facilities. This terminal would require initial disturbance of 412 acres for construction and long-term disturbance of 203 acres for operation.

The Project would be located in flat topography that is largely devoid of vegetation.

Due to visual compatibility of the Project with existing electrical utility structures and developments, the casual observer would not consider visual quality to be substantially diminished. As such, impacts to people and Class C scenery would be low. Project elements would have weak to moderate contrast with the existing landscape. These contrasts would be due to cylindrical and pyramidal forms, vertical and horizontal lines of structures and conductors, silvery-grey and tan colors, smooth textures resulting from the structures of the terminal site, multiple guyed steel lattice structures near the terminal site, wider, larger-appearing self-supporting steel lattice structures at the points-of-intersection, fences, and vegetation clearing for roads. Implementation of mitigation **VR-2** and **VR-8** would diminish the visibility of the Project and further reduce contrasts.

Design Option 2 – Southern Terminal near IPP

The implementation of Design Option 2 would utilize the same alternative routes and construction techniques as the proposed action. As such, impacts from construction and operation of this design option would be the similar to those discussed under the alternative routes. Differences between this design option and the proposed action include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The southern converter station would be located near IPP in Utah instead of Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP. Construction and operation of a converter station near IPP, ground electrode system, and series compensation station would be expected to impact visual resources as discussed under the Southern Terminal.

Design Option 3 – Phased Build Out

The implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed action. Impacts from construction and operation of this design option would be the same as those discussed under the other terminals and design options.

3.12.6.3 Impacts Common to all Alternative Routes and Associated Components

Construction Impacts

Visual resources would be impacted from transmission line construction due to the activities necessary to build the transmission line and related facilities. Viewshed disturbance includes guyed steel lattice and self-supporting steel lattice structures (**Figure 3.12-5**), conductors, cleared ROWs, temporary buildings and shelters, fences, and construction-related equipment, debris storage, and ground areas cleared for construction, such as Project access roads, transmission line tower work areas, conductor stringing and tensioning sites, communication and regeneration sites, material storage yards, batch plants, fly yards, staging areas, ground electrode systems, and one low voltage electrical line associated with each ground electrode system.

Direct impacts to people and scenery would occur from modifications of the characteristic landscape, and from introductions of contrasting forms, lines, colors and textures of landform, vegetation, and structures needed to accommodate Project construction activities.

In undeveloped areas, pyramidal forms of structures, vertical and horizontal lines of structures and conductors, silvery-grey and tan (ROW) colors, and smooth textures would result from multiple guyed steel lattice structures along the tangents, a single, wider, larger appearing, self-supporting steel lattice structure at the points-of-intersection and longer spans, and vegetation clearing, fences, and roads. These elements would contrast with existing characteristic landscapes to a moderate to strong degree. In viewsheds with existing electrical transmission line structures and ground disturbances, contrasts would be weak to moderate, depending on distance from the observer and number and type of structures (**Appendix I**,

Tables I-8 and **I-9**). In all cases, construction activities occurring in the immediate foreground of the observer would cause greater contrasts than those appearing at a further distance.

The introduction of the Project's construction-related structures, equipment, and areas' cubed forms, horizontal and vertical lines, multiple colors, and smooth textures in undeveloped areas would contrast with the characteristic landscape to a strong degree. In viewsheds with existing developed activities, contrasts would be weak to moderate, depending on proximity of the Project with similar activities and distance from observers.

In the short term of construction, direct impacts to people and scenery would be expected to be moderate to high and contrasts would comply with BLM VRM Class IV management objectives, and be consistent with USFS Low and Very Scenic Integrity Objectives and USFS Modification and Maximum Modification Visual Quality Objectives. Project construction activities, as discussed in the plan of development, that are located within 0.5 mile of high or moderate sensitivity viewers and have strong or moderate contrasts, would not be expected to comply with BLM VRM Classes III, or be consistent with USFS SIO High, or Medium, and USFS VQO Retention, or Partial Retention management objectives. Mitigations involving distances greater than 0.5 mile typically would reduce visual contrasts to moderate and, therefore, result in compliance with VRM Class III, and consistency with SIO Medium, and VQO Partial Retention management objectives.

Mitigation

The following nine mitigations are proposed for the Project. These mitigations would be applied to all high and moderate impacts to reduce impact levels for landscape scenery, sensitive viewers, compliance with BLM VRM objectives, and consistency with USFS SIOs or VQOs. For the purposes of analysis, impacts of these mitigations and residuals are disclosed in the following sections.

***VR-1**: Remove pinyon-juniper trees only as necessary for construction and maintenance of transmission towers and access roads. Feather the edges of any clearings. Pinyon-juniper trees in the ROW that are outside of the tower and road construction zone are left in place. Leave other trees in the ROW that would not present a safety or engineering hazard or otherwise interfere with operations. Where feasible, top rather than remove trees that exceed the allowable height. Openings in vegetation for facilities, structures, and roads should mimic, to the extent possible, the size, shape, and characteristics of naturally occurring openings.*

Effectiveness: This mitigation would substantially reduce impacts in immediate foreground, foreground-middleground, and background viewing situations.

***VR-2**: Use BLM environmental colors (Standard Environmental Colors, Color Chart CC-001, 2008) for surface coatings of permanent buildings, fences, gates, and tanks at terminal sites. Color selection is based on site-specific assessment at each site. Paint grouped structures the same color to reduce visual complexity and color contrast.*

Effectiveness: This mitigation would substantially reduce impacts of the terminal sites.

***VR-3**: Locate structures, roads, and other project elements as far back from road, trail, and river crossings (linear KOPs) as possible, and, where feasible, employ terrain and vegetation to screen views from crossings.*

Effectiveness: This mitigation would substantially reduce visual contrasts by decreasing the apparent size and extent of structures.

***VR-4**: In areas with no existing transmission lines move the transmission line (reference line) away from the immediate foreground of stationary (non-linear) KOPs to a distance of 0.5 miles or more. Where feasible, approach and cross linear KOPs such as roads and trails at right angles.*

Effectiveness: This mitigation would reduce visual contrasts from strong to moderate and moderate to weak.

***VR-5**: Materials and surface treatments of structures and land disturbances should repeat and/or blend with the existing form, line, color, and texture of the landscape and have little or no reflectivity (non-specular).*

Effectiveness: This mitigation would substantially reduce visual contrasts.

***VR-6**: Where paralleling an existing transmission line, where possible, place the structures to match the locations of structures in the existing line.*

Effectiveness: This mitigation would reduce line and form structure contrasts by blending structures with existing structures.

***VR-7**: Where possible, position roads at the toe of a slope, at the edge of vegetation openings, and perpendicular with the line of sight.*

Effectiveness: This mitigation would substantially reduce visual contrasts by blending roads and associated grading into the landscape.

***VR-8**: Minimize lighting at terminal and construction facilities to the extent permitted by OSHA and down-shield lights to reduce night glare and light pollution.*

Effectiveness: This mitigation would substantially reduce night-time visual contrasts by diminishing the effects of lighting on the night landscape.

***VR-9**: Where possible in tree-covered moderate to steep terrain, perform construction operations for towers and conductors with helicopters to reduce the need for access roads and laydown clearings.*

Effectiveness: This mitigation would substantially reduce visual contrasts by eliminating the need for terrain modification, grading and drainage disturbances and tree removal.

Implementation of mitigation **VR-1**, selective clearing of pinyon-juniper vegetation in the 250-foot-wide ROW would substantially reduce impacts in the immediate foreground, foreground-middleground, and background viewing situations. **Figures 3.12-8**, **3.12-9**, and **3.12-10** show a representative existing condition, simulated condition with full ROW clearing, and simulated mitigation with selective clearing in the zone of construction for structures, respectively. This example is located in Utah near the Mountain Meadows National Historic Landmark and Site, along Alternative III-A, Segment 501, Milepost 7.

Operation Impacts

Visual resources would be impacted during the operation of the Project due to contrasts from guyed steel lattice and/or self-supporting steel lattice structures, two electrical conductor phases with three wires per phase, terminal facilities, ground electrode facilities, and disturbance by cleared ROWs, permanent access roads and other areas of ground or vegetation disturbance.

Direct impacts to viewsheds similar to those discussed for the construction phase would be expected.

Figure 3.12-8 **Existing Condition for the Mountain Meadows National Historic Landmark and Site KOP Showing One Steel Lattice Transmission Line, Two H-frame Transmission Lines, and One Pipeline ROW Clearing**

TRANSWEST EXPRESS
TRANSMISSION PROJECT

Figure 3.12-9 **Simulated Condition for the Mountain Meadows National Historic Landmark and Site showing the TWE Guyed Transmission Line Structures and the Cleared 250-foot ROW**

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.12-10 **Simulated Mitigation Condition for the Mountain Meadows National Historic Landmark and Site KOP showing the TWE Guyed Transmission Line Structures and the Selectively-cleared 250-foot ROW**

TRANSWEST EXPRESS
TRANSMISSION PROJECT

Direct impacts to people and scenery would be expected to be moderate to high and contrasts would comply with BLM VRM Class IV management objectives, and be consistent with USFS Low and Very Low Scenic Integrity Objectives and USFS Modification and Maximum Modification Visual Quality Objectives. Project construction activities, as discussed in the plan of development, that are located within 0.5 mile of high or moderate sensitivity viewers and have strong or moderate contrasts, would not be expected to comply with BLM VRM Classes II or III, or be consistent with USFS SIO High, or Medium, and USFS VQO Retention, or Partial Retention management objectives. Mitigations involving distances greater than 0.5 mile typically would reduce visual contrasts to moderate and, therefore, result in compliance with VRM Class III, and consistency with SIO Medium, and VQO Partial Retention management objectives.

Indirect viewshed impacts would result from disturbance by human recreational activities, artifacts of activities, and vehicles with access to scenic landscapes by the Project's permanent access roads. Indirect impacts during operation would be expected to comply with agency management objectives in BLM VRM Class III and IV areas and be consistent with USFS SIO Medium and Low or USFS VQO Partial Retention, Modification, or Maximum Modification management objectives. Due to effects in landscapes without existing cultural modifications or with intact scenic integrity, indirect impacts in the immediate foreground 0.5 mile from sensitive viewers may not comply with BLM VRM Class II management objectives or be consistent with USFS SIO High or USFS VQO Retention management objectives. It is expected these impacts would be mitigated as much as possible on a case-by-case basis.

Design Option 2

Design Option 2 would consist of a 600-kV DC tubular pole transmission line from the Northern Terminal near Rawlins, WY to a new AC/DC converter station near the existing IPP substation near Delta, Utah. From the new converter station, a 500-kV AC transmission line would be constructed to connect with one of the existing substations in the Eldorado Valley, south of Boulder City, Nevada (Marketplace Hub). Design Option 2 would consist of the following elements that are different from the Project, that would cause effects to visual resources, scenery, and people: 1) 100 to 150-foot tall tubular pole structures with three conductors, and two static/communication wires (**Figures 3.12-6** and **3.12-7** show the character of these structures at distances of 0.25, 0.5, 1.0, and 2.0 miles with sky as background and landforms as background, respectively); 2) 345-kV AC transmission line of less than five miles between the new converter station and the existing IPP 345-kV AC substation; a series compensation station (similar to a small 500-kV substation) near the halfway point in the 500-kV line between IPP and Marketplace Hub.

The effects of Design Option 2 ROW clearing and access roads would be the same as for the Project. The tubular pole structures would cause decreased effects in the immediate foreground with sky as background (all road, river, and trail crossings) as compared with the guyed and self-supporting lattice structures (**Figure 3.12-6**). The tubular pole structures would cause increased effects beyond the immediate foreground with landforms as background, as compared with the guyed and self-supporting lattice structures (**Figure 3.12-7**). Non-specular (dulled surfaces) structure mitigations would decrease visual impacts in all cases as compared with specular (reflective) structures. However, the tubular pole structures would still have increased effects beyond the immediate foreground, as compared with guyed and self-supporting lattice structures. The additional (3rd) conductor, as compared with the Project's two conductors with three phases (wires), would have minimal increased effects on visual resources and not be consequential to the casual observer. The existing character of the IPP area is dominated by utility structures, roads, and buildings. As such, the addition of the new AC/DC converter station and transmission line would have minimal increased effects as compared to the existing conditions.

Design Option 3

Design Option 3 would consist of a "phased-buildout" of the Project and have similar effects to visual resources.

Decommissioning Impacts

Impacts to visual resources during the decommissioning phase of the Project would be similar to construction impacts.

3.12.6.4 Region I

Impact parameters that relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and differences by alternative are presented in this section. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-9**. Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**. The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-9**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, “walking the line”) are listed in the corresponding tables in **Appendix I**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I**, following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to routing engineering study for reference lines within 0.5 mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-10**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative I-A																																						
Alternative I-A Totals	**155**	**13**	**74**	**48**	**20**	**10**	**53**	**45**	**47**	**<1**	**61**	**93**	**29**	**41**	**85**	**--**	**72**	**43**	**--**	**--**	**--**	**58**	**53**	**44**	**7**	**97**	**51**	**8**	**38**	**109**	**110**	**5**	**40**	**110**	**5**	**40**	**5**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
40	10	1	2	6	1	1	2	6	1	--	--	10	--	--	10	--	--	5	--	--	--	--	--	10	--	1	9	--	1	9	5	--	5	5	--	5	<1
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2
110	15	1	10	5	--	--	3	6	6	--	--	15	--	6	9	--	2	6	--	--	--	--	--	15	--	1	14	--	--	15	8	--	7	8	--	7	--
110.05	4	--	2	2	--	--	--	2	2	--	--	4	--	2	2	--	--	2	--	--	--	--	--	4	--	2	2	--	--	4	2	--	2	2	--	2	--
120	23	--	6	11	6	1	5	3	14	--	9	14	1	12	10	--	12	11	--	--	--	9	14	--	--	17	6	1	5	17	20	2	<1	20	2	<1	--
180	2	2	<1	--	--	--	2	--	--	--	2	--	2	--	--	--	2	--	--	--	--	2	--	--	2	<1	--	--	2	--	<1	2	--	<1	2	--	<1
180.05	14	--	9	3	1	--	1	8	5	--	4	10	3	--	11	--	13	1	--	--	--	4	10	--	--	12	1	--	1	13	14	--	--	14	--	--	1
180.2	35	2	13	8	12	3	5	8	19	--	26	9	4	20	11	--	30	2	--	--	--	26	9	--	2	21	12	3	5	27	31	1	3	13	1	3	1
Alternative I-B																																						
Alternative I-B Totals	**159**	**13**	**64**	**57**	**25**	**15**	**54**	**51**	**39**	**1**	**60**	**98**	**40**	**22**	**97**	**--**	**88**	**25**	**--**	**--**	**--**	**57**	**51**	**51**	**7**	**92**	**60**	**12**	**38**	**109**	**105**	**8**	**46**	**105**	**8**	**46**	**18**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
40	10	1	2	6	1	1	2	6	1	--	--	10	--	--	10	--	--	5	--	--	--	--	--	10	--	1	9	--	1	9	5	--	5	5	--	5	<1
50	5	--	5	--	5	--	--	5	--	--	--	5	--	--	5	--	1	<1	--	--	--	--	--	5	--	--	5	--	--	5	1	--	4	1	--	4	--
60	19	1	4	12	2	1	4	7	7	--	--	19	--	2	17	--	12	<1	--	--	--	--	--	19	--	5	15	--	1	18	12	<1	7	12	<1	7	9
70	22	--	2	3	18	1	3	3	15	--	11	11	11	5	6	--	19	3	--	--	--	11	11	--	--	5	18	1	3	17	20	2	--	20	2	--	2
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
180	2	2	<1	--	--	--	2	--	--	--	2	--	2	--	--	--	2	--	--	--	--	2	--	--	2	<1	-	--	2	--	<1	2	--	<1	2	--	<1
180.05	14	--	9	3	1	<1	1	8	5	--	4	10	3	--	11	--	13	1	--	--	--	4	10	--	--	12	1	--	1	13	14	--	--	14	--	--	1
186	34	2	16	12	4	7	6	10	11	1	23	10	5	14	14	--	27	<1	--	--	--	24	10	--	2	28	4	7	6	21	24	4	6	23	4	6	3
190.05	1	--	--	1	--	--	1	--	--	--	--	1	--	--	1	--	1	--	--	--	--	--	--	1	--	--	1	--	--	1	1	--	<1	1	--	<1	--
Alternative I-C																																						
Alternative I-C Totals	**186**	**73**	**88**	**24**	**1**	**67**	**96**	**23**	**--**	**<1**	**94**	**91**	**29**	**60**	**97**	**--**	**38**	**45**	**--**	**--**	**--**	**52**	**59**	**75**	**28**	**117**	**41**	**31**	**81**	**74**	**82**	**<1**	**104**	**82**	**<1**	**104**	**42**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2
130	22	18	4	--	--	19	3	--	--	--	6	16	3	8	10	--	--	12	--	--	--	6	<1	16	6	12	14	6	12	3	12	--	10	12	--	10	9
140	16	16	1	--	--	11	5	--	--	--	14	3	4	8	5	--	--	14	--	--	--	--	14	3	--	16	--	--	11	5	14	--	2	14	--	2	9
140.05	2	2	1	--	--	1	1	--	--	--	<1	2	--	2	--	--	--	<1	--	--	--	<1	2	--	2	1	--	1	1	--	<1	--	2	<1	--	2	<1
190	93	30	52	10	1	31	51	11	--	<1	54	38	3	42	48	--	24	2	--	--	--	30	23	41	17	46	30	19	33	40	<1	--	67	25	<1	67	22
190.05	1	--	--	1	--	--	1	--	--	--	--	1	--	--	1	--	1	--	--	--	--	--	--	1	--	--	1	--	--	1	1	--	<1	1	--	<1	--
Alternative I-D																																						
Alternative I-D Totals	**171**	**20**	**105**	**41**	**6**	**13**	**67**	**62**	**29**	**1**	**76**	**94**	**32**	**39**	**100**	**--**	**85**	**44**	**--**	**--**	**--**	**59**	**61**	**51**	**10**	**119**	**42**	**11**	**38**	**121**	**114**	**14**	**43**	**114**	**14**	**43**	**7**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
40	10	1	2	6	1	1	2	6	1	--	--	10	--	--	10	--	--	5	--	--	--	--	--	10	--	1	9	--	1	9	5	--	5	5	--	5	<1
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
110	15	1	10	5	--	--	3	6	6	--	--	15	--	6	9	--	2	6	--	--	--	--	--	15	--	1	14	--	--	15	8	--	7	8	--	7	--
115	7	1	6	<1	--	--	2	5	--	--	--	7	--	3	4	--	--	5	--	--	--	--	--	7	--	1	6	--	--	7	5	--	2	5	--	2	--
115.05	18	3	14	--	--	--	11	7	--	--	15	3	--	4	13	--	7	10	--	--	--	--	15	3	--	18	--	--	--	18	16	2	<1	16	2	<1	--
115.07	18	5	14	--	--	<1	5	7	5	--	12	7	2	11	5	--	18	--	--	--	--	12	7	--	5	14	--	<1	5	13	10	8	<1	10	8	<1	--
115.1	3	--	3	--	--	--	1	2	--	--	3	--	3	--	--	--	3	--	--	--	--	3	--	--	--	3	--	<1	1	2	3	--	--	3	--	--	<1
180.05	14	--	9	3	1	--	1	8	5	--	4	10	3	--	11	--	13	1	--	--	--	4	10	--	--	12	1	--	1	13	14	--	--	14	--	--	1
186	34	2	16	2	4	7	6	10	11	1	23	10	5	14	14	--	27	<1	--	--	--	24	10	--	2	28	4	7	6	21	23	4	6	23	4	6	3
190.05	1	--	--	1	--	--	1	--	--	--	--	1	--	--	1	--	1	--	--	--	--	--	--	1	--	--	1	--	--	1	1	--	<1	1	--	<1	--
Mexican Flats Connector																																						
Mexican Flat Connector Totals	**10**	**2**	**2**	**4**	**2**	**1**	**2**	**3**	**4**	**--**	**<1**	**10**	**--**	**<1**	**10**	**--**	**--**	**9**	**--**	**--**	**--**	**<1**	**2**	**8**	**2**	**2**	**6**	**1**	**1**	**8**	**9**	**<1**	**1**	**9**	**<1**	**1**	**1**
150	4	--	2	2	--	--	1	3	<1	--	--	4	--	--	4	--	--	3	--	--	--	--	--	4	--	2	2	--	--	4	3	--	<1	3	--	<1	--
150.05	2	2	<1	--	--	1	1	--	--	--	<1	2	--	<1	2	--	--	2	--	--	--	<1	2	--	2	<1	--	1	1	2	2	--	<1	2	--	<1	1
160	4	--	--	2	2	--	--	--	4	--	--	4	--	--	4	--	--	4	--	--	--	--	--	4	--	--	4	--	--	4	4	--	<1	4	--	<1	--
Baggs Connector																																						
Baggs Connector Totals	**22**	**2**	**19**	**1**	**--**	**1**	**10**	**11**	**--**	**--**	**20**	**2**	**8**	**12**	**2**	**--**	**18**	**<1**	**--**	**--**	**--**	**20**	**2**	**--**	**2**	**20**	**--**	**1**	**10**	**11**	**13**	**5**	**4**	**13**	**5**	**4**	**<1**
170	3	1	2	--	--	1	2	--	--	--	2	1	--	2	1	--	2	<1	--	--	--	2	1	--	1	2	--	1	2	--	2	<1	1	2	<1	1	<1
170.05	17	--	16	1	--	--	7	10	--	--	17	1	6	10	1	--	14	--	--	--	--	17	1	--	--	17	--	--	7	10	11	3	3	11	3	3	--
170.1	2	1	1	--	--	--	1	1	--	--	2	--	2	--	--	--	2	--	--	--	--	2	--	--	1	1	--	--	1	1	1	1	--	1	1	--	--

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Fivemile Point North Connector																																					
116 (Total)	3	2	1	--	--	1	2	--	--	--	3	<1	--	3	--	--	2	<1	--	--	--	3	<1	--	2	1	--	1	2	--	<1	2	<1	1	2	<1	1
Fivemile Point South Connector																																					
117 (Total)	2	--	2	--	--	--	2	--	--	--	2	--	--	2	1	--	2	--	--	--	--	2	<1	--	--	2	--	--	2	--	1	<1	<1	1	<1	<1	--

[1] High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

[2] Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I, Table I-1**; **Appendix I, Figures I-2** and **I-3**).

[3] BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I, Table I-5**; **Appendix I, Figure I-7**).

[4] BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[5] USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[6] Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

[7] Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

[8] BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures** in **Appendix I**).

[9] Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-21**.

Table 3.12-10 Region I Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative I-A				
20	<1	--	--	<1
30	32	--	--	32
40	10	--	--	10
100	19	--	--	19
110	15	--	--	15
110.05	4	--	--	4
120	23	--	2	21
180	2	--	2	--
180.05	14	--	4	10
180.2	35	--	26	9
Alternative I-B				
20	<1	--	--	<1
30	32	--	--	32
40	10	--	--	10
50	5	--	--	5
60	19	--	--	19
70	22	--	1	21
100	19	--	--	19
180	2	--	2	--
180.05	14	--	4	10
186	34	--	22	12
190.05	1	--	--	1
Alternative I-C				
20	<1	--	--	<1
30	32	--	--	32
100	19	--	--	19
130	22	--	6	16
140	17	--	14	3
140.05	2	--	<1	2
190	93	<1	11	81
190.05	1	--	--	1
Alternative I-D				
20	<1	--	--	<1
30	32	--	--	32
40	10	--	--	10

Table 3.12-10 Region I Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
100	19	--	--	19
110	15	--	--	15
115	7	--	--	7
115.05	18	--	15	3
115.07	19	--	12	7
115.1	3	--	3	--
180.05	14	--	4	10
186	34	--	22	12
190.05	1	--	--	1
Mexican Flats Connector				
150	4	--	--	4
150.05	2	--	<1	2
160	4	--	--	4
Baggs Connector				
170	3	--	2	1
170.05	17	--	16	1
170.1	2	--	2	--
Fivemile Point North Connector				
116	3	--	3	<1
Fivemile Point South Connector				
117	2	--	2	<1

Segment numbers depicted in **Figure 2-21**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-11** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-11 Region I Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
I-A	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-A	40	SR 789, The Outlaw Trail Scenic Loop 0 Residences
I-A	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences

Table 3.12-11 Region I Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
I-A	110	8 Mile Lake Rd, Coal Bank Wash, Echo Springs Draw, Eightmile Lake, Fivemile Lake, Wamsutter Rd 0 Residences
I-A	110.05	Coal Gulch, North Barrel Springs Draw 0 Residences
I-A	120	Cedar Breaks Draw, StandaRd Rd, W Hangout Rd, West Flat Top Mountain 0 Residences
I-A	180.05	CR 4, CR 66 0 Residences
I-A	180.2	Camping Unit - North, Camping Unit - South, CR 10, CR 21, CR 21s, CR 66, CR 66b, CR 66n, CR 66w, CR 75, CR 75e, CR 75s, CR 85, East Cross Mtn. River Access, HWY 318, Raftopolis Hunting Lease WMA, Raftopolis Ranch SWA, Sevenmile Ridge, US 40 1 Residence
I-B	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-B	40	SR 789, The Outlaw Trail Scenic Loop 0 Residences
I-B	50	Wamsutter Crooks Gap Rd 0 Residences
I-B	60	Barrel Springs Rd, Eureka Headquarters Rd 0 Residences
I-B	70	4wd Rd, Adobe Town Dispersed Recreation Use Area, Cherokee Trail, Cherokee Trail Rd, Church Butte, Lower Willow Creek Spring, Reader Cabin Draw, Shell Creek Stock Trl, Windmill Draw Rd 0 Residences
I-B	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences
I-B	180.05	CR 4, CR 66 0 Residences
I-B	186	Cedar Springs Draw, CR 10, CR 21, CR 26, CR 66, CR 66n, CR 85, HWY 318, Lone Tree Gulch, Reservoir Spring, South Cross Mtn. Trailhead, Spence Gulch, US 40 0 Residences
I-C	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-C	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences
I-C	130	Coal Bank Spring, Overland Trail, Pine Butte, Upper Muddy Creek/Grizzly ACEC 1 Residence
I-C	140	Blue Gap Draw, Cherokee Creek, Little Robbers Gulch, Pines Draw, Rawlins to Baggs Stage Rd, Robbers Gulch, Wild Cow Rd, Wild Horse Draw 0 Residences
I-C	140.05	Deep Creek, White Rock Draw 0 Residences

Table 3.12-11 Region I Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
I-C	190	4wd Rd, 5th Ave, Access Rd, Aiken St, Battle Scenic Highway, Bitter Brush SWA, Blue Gravel Creek, Bogenschutz Creek, Burbank Draw, Cc Rd 601, Cc Rd 702, Cottonwood Creek, CR 100, CR 101, CR 103, CR 107, CR 11, CR 110, CR 117, CR 120, CR 13, CR 139, CR 143, CR 17, CR 173, CR 18, CR 2, CR 213, CR 23, CR 27, CR 30, CR 33, CR 35, CR 38, CR 40, CR 53, CR 57, CR 59, CR 70, CR 73, CR 74, CR 78, CR 86, CR 90, Craig Raw Water Reservoir, Culverwell Reservoir, Dry Cottonwood Creek, East Juniper Mtn. Trailhead, Hicox Draw, Johnson Gulch, Juniper Mountain SRMA, Little Cottonwood Creek, Mesa Ave, Mexican Creek, Rangely Way, Roberts Rd, Saddorus Rd, Sheehan Lane Rd, South Beach Trail Area, SR 13, SR 394, SR 70, Thompson Way, Union St, US 40, W Mesa Rd, Wheatridge Dr, Willow Creek, Wilson St, Yampa River 114 Residences
I-D	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-D	40	SR 789, The Outlaw Trail Scenic Loop 0 Residences
I-D	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences
I-D	110	8 Mile Lake Rd, Coal Bank Wash, Echo Springs Draw, Eightmile Lake, Fivemile Lake, Wamsutter Rd 0 Residences
I-D	115	Duck Lake, Duck Lake Rd, Little Coal Gulch 0 Residences
I-D	115.05	Hangout Rd, Little Robbers Rd, North Fork Cottonwood Creek, Straten Rd, Streckfus Draw 0 Residences
I-D	115.07	Cottonwood Draw Rd, Government Rd, Hangout Wash, North Prong Red Creek 0 Residences
I-D	115.1	Cherokee Draw 0 Residences
I-D	180.05	CR 4, CR 66 0 Residences
I-D	186	Cedar Springs Draw, CR 10, CR 21, CR 26, CR 66, CR 66n, CR 85, HWY 318, Lone Tree Gulch, Reservoir Spring, South Cross Mtn. Trailhead, Spence Gulch, US 40 0 Residences
Mexican Flats Alternative Connector	150.05	SR 789, Wamsutter Rd 0 Residences
Baggs Alternative Connector	170.05	4wd Rd, Cherokee Rim, CR 144, Devils Canyon, Poison Buttes, Red Creek
Fivemile Point North Alternative Connector	116	Cottonwood Creek, Cottonwood Draw, Rawlins to Baggs Stage Rd, The Bluffs 0 Residences
Fivemile Point South Alternative Connector	117	4wd Rd. 0 Residences

Segment numbers depicted in **Figure 2-21**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above 4 feet in height would occur in the 250-foot-wide ROW unless otherwise specified in the PDTR. Only the 90-foot-wide “wire zone” and 250-foot-square structure construction area would be cleared in corridors classified as VRM Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding

tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 294 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-10**. The results are central components in **Table 3.12-9**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region I are portrayed by tables and maps of scenic quality classes (**Appendix I**, **Table I-1** and **Figure I-2**), sensitivity levels (**Appendix I**, **Table I-2** and **Figure I-4**), visual resource inventory classes (**Appendix I**, **Table I-5** and **Figure I-7**), and visual resource management classes (**Appendix I**, **Table I-6** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery, sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 41 KOPs selected, photographed, and analyzed in Region I. The KOP figures in **Appendix I** portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation. Thirty-one photographic simulations of the Project in Region I, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures in **Appendix I**.

Estimates of impacts to scenery and impacts to humans are based on comparisons of the Project's visual characteristics with characteristics of the landscape and locations and visual sensitivities of people. Compliance or consistency with agency management objectives is based on the agencies' planned limits of acceptable alteration or changes to the landscape. The Project's visual characteristics, affected environment, and analysis of environmental effects are documented in this report and in **Appendix I**.

Alternative I-A (Applicant Proposed)

Alternative I-A would cross 155 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River, Yampa River, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Cedar Breaks Draw, Sand Wash Basin, Little Snake River, and Yampa River Valley/Cross Mountain areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-A would be visible in the immediate foreground from four residences. Thirty-seven percent of Alternative I-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Five percent of Alternative I-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5 miles) viewing situations (**Table 3.12-11**). Three percent of Alternative I-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-A is comparable to Alternative I-B and Alternative I-D, except where it would cross the Cedar Breaks Draw area which would cause increased impacts over Alternative I-B. Alternative I-A has decreased impacts as compared with Alternative I-C. Three percent of the Alternative I-A reference line would be located within a

utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Tuttle Easement micro-siting options could be utilized with outcomes similar to those discussed under Alternative I-D.

Alternative I-B

Alternative I-B would cross 159 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River, Yampa River, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**), and would be "sky-lined" (increased impact) in those areas. Segment 70 blends visually with an existing cleared pipeline ROW. Recreationally important landscapes include the Cedar Breaks Draw, Sand Wash Basin, Little Snake River, and Yampa River Valley/Cross Mountain areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-B would be visible in the immediate foreground from three residences. Thirty-six percent of Alternative I-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Four percent of Alternative I-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5 miles) viewing situations (**Table 3.12-11**). Five percent of Alternative I-B would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-B is comparable to Alternative I-A and Alternative I-D, except where it would parallel the existing cleared pipeline ROW which would cause decreased impacts over Alternative I-A and Alternative I-D. Alternative I-B has decreased impacts as compared with Alternative I-C. Eleven percent of the Alternative I-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Tuttle Easement micro-siting options could be utilized with outcomes similar to those discussed under Alternative I-D.

Alternative I-C

Alternative I-C would cross 186 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would closely parallel the Outlaw Scenic Highway in Wyoming and Colorado State Highway 13 in Colorado. It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River east of Baggs, Yampa River east of Craig, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Little Snake River and Yampa River Valley areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. It would closely parallel the Yampa River in the Juniper Mountain area west of Craig, however it is co-located with an existing 345-kV steel lattice and wooden H-frame transmission lines. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-C would be visible in the immediate foreground from 118 residences. Twenty-eight percent of Alternative I-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Fifteen percent of Alternative I-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Less than 1 percent of Alternative I-C would not comply with

agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-C has increased impacts as compared with Alternative I-A, I-B, and I-D. Twenty-three percent of the Alternative I-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Tuttle Easement micro-siting options could be utilized with outcomes similar to those discussed under Alternative I-D.

Alternative I-D (Agency Preferred)

Alternative I-D would cross 171 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River, Yampa River, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**) and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Cedar Breaks Draw, Sand Wash Basin, Little Snake River, and Yampa River Valley/Cross Mountain areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-D would be visible in the immediate foreground from three residences. Thirty-four percent of Alternative I-D would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Six percent of Alternative I-D would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Eight percent of Alternative I-D would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-D is comparable to Alternative I-A and Alternative I-B, except where it would cross the Cedar Breaks Draw area which would cause increased impacts over Alternative I-B. Alternative I-D has decreased impacts as compared with Alternative I-C. Four percent of the Alternative I-D reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Tuttle Easement Micro-siting Option 1

The Tuttle Easement Option 1 would cross landscapes in the Wyoming Basin Province (Section 3.12.5.1) and Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2). It would closely parallel and is located on the far side of two existing transmission lines in the area near U.S. 40 and Deer Lodge Road, an entry road to Dinosaur National Monument. These circumstances would result in lower visual contrasts than Tuttle Easement Option 2 or Tuttle Easement Option 3. The Tuttle Easement Option 1 would have decreased impacts as compared to Tuttle Easement Option 2 and Tuttle Easement Option 3. Thirty percent of the Tuttle Easement Micro-siting Option 1 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor. Field photography and preparation of visual contrast rating worksheets for this option will be completed for the Final EIS.

Tuttle Easement Micro-siting Option 2

The Tuttle Easement Option 2 would cross landscapes in the Wyoming Basin Province (Section 3.12.5.1) and Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2). It would cross U.S. 40, a turnout/parking area, and the intersection with Deer Lodge Road, an entry road to Dinosaur National

Monument, and would closely parallel U.S. 40. It would cross these locations with the more visually dominant self-supporting structures at acute angles in two places. It would be “sky-lined” (increased impact) in those areas and have higher contrasts than Tuttle Easement Option 1 or Tuttle Easement Option 3. The Tuttle Easement Option 2 would cause high impacts to high sensitivity recreational viewers in immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Tuttle Easement Option 2 would cross VRM Class III landscapes in the same location as Tuttle Easement Option 3, where changes may attract attention, but should not dominate the view of the casual observer. Tuttle Easement Option 2 would have increased impacts as compared to Tuttle Easement Option 1 and Tuttle Easement Option 3. Seventeen percent of the Tuttle Easement Micro-siting Option 2 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor. Field photography, preparation of visual contrast rating worksheets, and visual simulations for this option will be completed for the Final EIS.

Tuttle Easement Micro-siting Option 3

The Tuttle Easement Option 3 would cross landscapes in the Wyoming Basin Province (Section 3.12.5.1) and Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2). It would cross Deer Lodge Road, an entry road to Dinosaur National Monument, and would be “sky-lined” (increased impact) in this area. The Tuttle Easement Option 3 would cause high impacts to high sensitivity recreational and residential viewers at the Deer Lodge Road crossing. This location is associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Tuttle Easement Option 3 would cross VRM Class III landscapes in the same location as Tuttle Easement Option 2, where changes may attract attention, but should not dominate the view of the casual observer. The Tuttle Easement Option 3 would have increased impacts as compared Tuttle Easement Option 1 and decreased impacts as compared to Tuttle Easement Option 2. Seventeen percent of the Tuttle Easement Micro-siting Option 3 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor. Field photography, preparation of visual contrast rating worksheets, and visual simulations for this option will be completed for the Final EIS.

<u>Alternative Connectors in Region I</u>

Mexican Flat Connector

The Mexican Flat Connector cross 10 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Outlaw Scenic Highway and would be “sky-lined” (increased impact) in that area, and also cross several minor service roads. The Mexican Flat Connector would be seen in the immediate foreground from zero residences. Less than 1 percent of the Mexican Flat Connector cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty percent of the Mexican Flat Connector cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Less than 1 percent of the Mexican Flat Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Mexican Flat Connector would exclude the need for Alternatives I-A, I-C, and I-D segments southward and take advantage of the decreased impacts of Alternative I-B and its existing cleared pipeline ROW. Ten percent of the Mexican Flat Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Fivemile Point North Connector

The Fivemile Point North Connector would cross 3 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It is located in the footprint of the Stock Trail Road (a major recreational road) for 2.5 miles and would cross the Outlaw Scenic Highway. It would be “sky-lined” (increased impact) in those

areas. The Fivemile Point North Connector is in the immediate foreground from zero residences. One hundred percent of the Fivemile Point North Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixty-seven percent of the Fivemile Point North Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Sixty-seven percent of the Fivemile Point North Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Fivemile Point North Connector would exclude the need for Alternative I-C segments southward. The Fivemile Point North Connector has greatly increased impacts over all other alternatives for its 2.5-mile reach. Thirty-three percent of the Fivemile Point North Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Fivemile Point South Connector

The Fivemile Point South Connector would cross 2 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Stock Trail Road (a major recreational road) and would be “sky-lined” (increased impact) in that area. The Fivemile Point South Connector is in the immediate foreground from zero residences. One hundred percent of the Fivemile Point South Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of the Fivemile Point South Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Less than 1 percent of the Fivemile Point South Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Fivemile Point South Connector would have decreased impacts over its reach, but would involve the increased impacts of the Baggs Connector and, possibly, Alternative I-C, which has increased impacts over Alternatives I-A, I-B, and I-D. None of the Fivemile Point South Connector reference line would be located within a utility corridor or utility window.

Baggs Connectors

The Baggs Connectors cross 22 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). They cross the Outlaw Scenic Highway, Old Cherokee Trail-South, in addition to several recreational roads and trails (**Table 3.12-11**), and would be “sky-lined” (increased impact) in those areas. Recreationally important landscapes include the Fivemile Point, Tincan Hill, Poison Buttes, Snake River Valley, Cherokee Rim, and Cherokee Draw areas, where the Project’s guyed and, substantially more dominant self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. The Baggs Connectors would be seen in the immediate foreground from zero residences. Ninety-one percent of the Baggs Connectors cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Nine percent of the Baggs Connectors cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Twenty-three percent of the Baggs Connectors would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Baggs Connectors have increased impacts as compared with the Mexican Flats Connectors. The Baggs Connectors would exclude the need for I-C segments (increased impacts) southward. Less than 1 percent of the Baggs Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

3.12.6.5 Region II

Impact parameters relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and differences by alternative are presented below. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual Impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-12**.

Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**. The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

Residual Impacts

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-12**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, “walking the line”) are listed in the corresponding tables in **Appendix I**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to routing engineering study for, reference lines within 0.5 mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-13**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-14** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative II-A																																					
Alternative II-A Total	**257**	**78**	**127**	**35**	**17**	**72**	**132**	**44**	**9**	**<1**	**139**	**118**	**9**	**33**	**111**	**--**	**48**	**51**	**<1**	**21**	**--**	**97**	**78**	**82**	**61**	**116**	**80**	**55**	**93**	**109**	**116**	**4**	**137**	**117**	**3**	**137**	**29**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
211	8	--	2	6	--	--	1	3	5	--	8	<1	--	--	8	--	8	1	--	--	--	8	<1	--	--	8	--	--	1	8	8	--	<1	8	--	<1	1
212	13	--	4	7	2	2	6	3	2	--	13	--	--	--	13	--	3	10	--	--	--	--	--	13	--	--	13	--	2	11	13	--	--	13	--	--	5
213	13	2	11	1	--	1	4	7	2	<1	3	10	--	--	13	--	4	8	--	--	--	--	<1	13	--	2	12	--	1	13	11	--	2	11	--	2	11
320.05	24	12	11	--	--	6	11	8	--	--	15	8	--	--	5	--	1	3	--	--	--	8	4	11	10	4	10	4	4	16	4	--	20	4	--	20	--
320.1	74	36	37	1	--	21	49	4	--	--	55	19	1	--	--	--	--	--	--	18	--	37	15	22	27	33	14	19	23	32	16	2	56	16	2	56	1
320.15	28	12	15	--	--	8	13	7	--	--	26	2	7	--	8	--	--	--	<1	3	--	26	2	--	12	15	--	8	13	7	3	0	25	3	0	25	--
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	<1	5	2	--	5	--
340	20	8	12	--	--	12	7	1	--	--	8	12	--	15	5	--	1	2	--	--	--	8	2	10	4	11	6	7	8	5	3	--	17	3	--	17	--
360	26	<1	2	9	14	10	11	4	--	--	5	21	--	14	12	--	12	10	--	--	--	5	21	--	<1	12	14	10	11	4	20	2	4	21	1	4	1
430	18	3	5	9	1	2	9	7	--	--	--	18	--	3	15	--	--	16	--	--	--	--	18	--	3	14	1	2	9	7	16	--	2	16	--	2	--
Alternative II-B																																					
Alternative II-B Total	**345**	**95**	**197**	**38**	**15**	**170**	**146**	**29**	**--**	**1**	**131**	**213**	**19**	**49**	**243**	**5**	**135**	**66**	**3**	**18**	**--**	**96**	**134**	**115**	**43**	**236**	**66**	**83**	**183**	**79**	**176**	**51**	**118**	**214**	**13**	**118**	**142**
220.1	181	63	93	12	10	112	59	7	--	1	66	115	14	25	142	5	115	32	--	--	--	48	61	71	22	123	33	53	94	31	109	43	29	144	9	29	111
222.05	41	9	26	6	--	17	19	5	--	--	17	24	--	10	31	--	13	18	--	--	--	6	26	10	3	38	--	6	21	15	27	4	10	31	--	10	19
222.3	15	1	6	8	--	2	8	5	--	--	1	14	5	<1	9	--	1	<1	--	--	--	--	--	15	--	1	13	--	2	13	2	--	13	2	--	13	<1
310	49	16	31	2	--	15	25	9	--	--	28	21	--	1	23	--	5	--	--	18	--	27	17	6	13	34	2	12	25	12	21	1	27	21	1	27	2
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
370	14	<1	4	5	4	1	11	3	--	--	8	6	--	--	13	--	--	7	1	<1	--	4	6	4	--	8	7	1	5	8	7	1	6	7	1	6	5
380	13	<1	12	--	--	4	9	--	--	--	2	10	--	--	10	--	<1	<1	2	<1	--	2	10	--	<1	12	--	4	9	--	<1	2	10	<1	2	10	3
420	8	--	3	5	--	2	6	--	--	--	--	8	--	--	8	--	1	4	--	--	--	--	7	1	--	7	1	<1	8	--	5	--	3	5	--	3	--
440	9	--	9	--	--	9	--	--	--	--	--	8	--	1	4	--	--	1	--	--	--	--	--	8	--	--	9	--	9	--	1	--	8	1	--	8	--
Alternative II-C																																					
Alternative II-C Total	**364**	**91**	**215**	**48**	**10**	**207**	**142**	**15**	**--**	**3**	**124**	**237**	**22**	**64**	**242**	**5**	**159**	**55**	**9**	**20**	**--**	**84**	**143**	**137**	**33**	**247**	**81**	**111**	**184**	**69**	**181**	**66**	**117**	**217**	**31**	**117**	**141**
220.1	181	63	93	12	10	112	59	7	--	1	66	115	14	25	142	5	115	32	--	--	--	48	61	71	22	123	33	53	94	31	109	43	29	144	9	29	111
225.2	38	6	24	8	--	26	12	--	--	--	15	23	8	23	7	--	22	--	--	--	--	12	16	11	3	27	8	20	13	5	12	10	16	12	10	16	10
330.1	99	19	61	19	--	44	48	7	--	2	43	55	--	14	58	--	14	16	7	16	--	23	30	47	6	62	31	23	44	32	43	10	46	43	3	18	13
410	37	2	26	9	--	15	22	<1	--	--	1	36	--	--	31	--	7	7	2	4	--	1	36	--	2	35	--	15	22	<1	17	3	18	17	3	18	6
440	9	--	9	--	--	9	--	--	--	--	--	8	--	1	4	--	--	1	--	--	--	--	--	8	--	--	9	--	9	--	1	--	8	1	--	8	--

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative II-D																																					
Alternative II-D Total	**262**	**51**	**116**	**50**	**45**	**72**	**104**	**47**	**39**	**25**	**98**	**139**	**40**	**62**	**138**	**2**	**50**	**94**	**<1**	**8**	**--**	**103**	**98**	**61**	**47**	**142**	**73**	**50**	**101**	**111**	**143**	**11**	**108**	**146**	**8**	**108**	**82**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
214	10	--	5	5	--	--	1	3	6	--	9	1	--	--	10	--	6	1	--	--	--	9	1	--	--	10	--	--	1	9	6	--	4	6	--	4	7
215	8	1	3	3	2	1	2	3	2	--	1	7	--	--	8	--	--	8	--	--	--	--	--	8	--	1	7	--	1	7	8	--	--	8	--	--	8
217.01	79	15	23	13	28	19	21	14	25	11	29	38	22	9	42	2	6	55	--	--	--	27	15	37	15	27	37	11	15	53	57	5	16	57	5	16	51
217.02	16	1	15	--	--	--	1	10	6	13	1	1	16	--	--	--	2	--	--	--	--	15	1	--	1	15	--	--	1	15	2	--	14	2	--	14	--
217.1	21	9	6	6	1	11	8	2	--	--	12	9	2	14	5	--	2	1	--	--	--	7	10	4	6	13	2	5	12	4	2	<1	19	2	<1	19	2
217.15	36	13	18	5	--	10	22	4	--	--	26	10	--	9	11	--	3	--	<1	8	--	26	9	1	13	22	1	10	21	5	7	4	25	9	2	25	3
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	--	5	2	<1	5	--
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
360	26	<1	2	9	14	10	11	4	--	--	5	21	--	14	12	--	12	10	--	--	--	5	21	--	<1	12	14	10	11	4	20	2	4	21	1	4	1
430	18	3	5	9	1	2	9	7	--	--	--	18	--	3	15	--	--	16	--	--	--	--	18	--	3	14	1	2	9	7	16	--	2	16	--	2	--
Alternative II-E																																					
Alternative II-E Total	**266**	**84**	**125**	**35**	**22**	**71**	**118**	**50**	**27**	**10**	**135**	**121**	**31**	**45**	**113**	**--**	**44**	**56**	**<1**	**23**	**--**	**109**	**98**	**59**	**67**	**137**	**62**	**49**	**100**	**117**	**121**	**2**	**143**	**121**	**1**	**143**	**71**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
213	13	2	11	1	--	1	4	7	2	<1	3	10	--	--	13	--	4	8	--	--	--	--	<1	13	--	2	12	--	1	13	11	--	2	11	--	2	11
214	10	--	5	5	--	--	1	3	6	--	9	1	--	--	10	--	6	1	--	--	--	9	1	--	--	10	--	--	1	9	6	--	4	6	--	4	7
215	8	1	3	3	2	1	2	3	2	--	1	7	--	--	8	--	--	8	--	--	--	--	--	8	--	1	7	--	1	7	8	--	--	8	--	--	8
215.05	7	--	--	2	5	<1	7	--	--	--	6	<1	--	--	7	--	1	6	--	--	--	--	--	7	--	--	7	--	<1	7	7	--	--	7	--	--	7
217.051	21	6	13	2	--	10	11	--	--	<1	12	9	9	12	--	--	<1	--	--	--	--	9	7	5	2	19	--	3	17	1	<1	--	21	<1	--	21	<1
217.052	16	13	3	--	--	12	5	--	--	1	12	3	8	--	--	--	--	--	<1	9	--	13	3	<1	12	5	--	11	6	--	9	<1	8	9	<1	8	7
320.05	24	12	11	--	--	6	11	8	--	--	15	8	--	--	5	--	1	3	--	--	--	8	4	11	10	4	10	4	4	16	4	--	20	4	--	20	--
320.15	28	12	15	--	--	8	13	7	--	--	26	2	7	--	8	--	--	--	<1	3	--	26	2	--	12	15	--	8	13	7	3	<1	25	25	3	<1	--
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	--	5	2	<1	5	--
325.1	43	26	13	4	--	3	14	8	17	6	29	8	5	--	--	--	--	--	--	12	--	21	19	3	18	25	<1	--	5	38	12	--	31	12	--	31	15
325.2	4	1	3	--	--	--	2	2	--	3	1	--	1	3	--	--	<1	--	--	--	--	4	--	--	1	3	--	--	2	2	<1	--	4	<1	--	4	4
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
360	26	<1	2	9	14	10	11	4	--	--	5	21	--	14	12	--	12	10	--	--	--	5	21	--	<1	12	14	10	11	4	20	2	4	21	1	4	1
430	18	3	5	9	1	2	9	7	--	--	--	18	--	3	15	--	--	16	--	--	--	--	18	--	3	14	1	2	9	7	16	--	2	16	--	2	--

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative II-F																																					
Alternative II-F Total	**267**	**74**	**128**	**31**	**34**	**88**	**104**	**33**	**42**	**45**	**102**	**120**	**66**	**23**	**138**	**2**	**39**	**83**	**4**	**14**	**--**	**128**	**69**	**70**	**71**	**123**	**73**	**61**	**105**	**101**	**130**	**12**	**125**	**133**	**8**	**126**	**93**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
214	10	--	5	5	--	--	1	3	6	--	9	1	--	--	10	--	6	1	--	--	--	9	1	--	--	10	--	--	1	9	6	--	4	6	--	4	7
215	8	1	3	3	2	1	2	3	2	--	1	7	--	--	8	--	--	8	--	--	--	--	--	8	--	1	7	--	1	7	8	--	--	8	--	--	8
217.01	78	15	23	13	28	19	21	14	25	11	29	38	22	9	42	2	6	55	--	--	--	27	15	37	15	27	37	11	15	53	57	5	16	57	5	16	51
217.052	16	13	3	--	--	12	5	--		1	12	3	8	--	--	--	--	--	<1	9	--	13	3	<1	12	5	1	11	6	--	9	<1	8	9	<1	8	7
218	12	3	8	<1	--	--	<1	3	9	12	--	--	12	--	--	--	3	--	--	--	--	12	--	--	3	9	--	--	<1	12	3	--	9	3	--	9	1
219.1	1	1	--	--	--	--	1	--	--	1	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	--	1	--	--	--	1	--	--	1	<1
219.2	20	18	2	--	--	13	6	--	--	20	--	<1	14	--	--	--	--	--	--	--	--	20	<1	--	18	2	--	13	6	--	5	4	11	9	--	11	--
219.3	2	2	--	--	--	2	--	--	--	--	--	2	2	--	--	--	--	--	--	--	--	--	2	--	2	--	--	2	--	--	--	--	2	--	--	2	--
320.15	28	12	15	--	--	8	13	7	--	--	26	2	7	--	8	--	--	--	<1	3	--	26	2	--	12	15	--	8	13	7	3	<1	25	3	<1	25	--
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	--	5	2	--	5	--
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
370	14	<1	4	5	4	1	11	3	--	--	8	6	--	--	13	--	--	7	1	<1	--	4	6	4	--	8	7	1	5	8	7	1	6	7	1	6	5
380	13	<1	12	--	--	4	9	--	--	--	2	10	--	--	10	--	<1	<1	2	<1	--	2	10	--	<1	12	--	4	9	--	<1	2	10	<1	2	10	3
420	8	--	3	5	--	2	6	--	--	--	--	8	--	--	8	--	1	4	--	--	--	--	7	1	--	7	1	<1	8	--	5	--	3	5	--	3	--
440	9	--	9	--	--	9	--	--	--	--	--	8	--	1	4	--	--	1	--	--	--	--	--	8	--	--	9	--	9	--	1	--	8	1	--	8	--
Emma Park Variation																																					
Emma Park Variation	35	4	31	--	--	<1	19	10	6	31	2	2	33	1	--	--	5	--	--	--	--	34	1	--	4	31	--	<1	20	15	5	--	30	5	--	30	<1
217.02	16	1	15	--	--	--	1	10	6	13	1	1	16	--	--	--	2	--	--	--	--	15	1	--	1	15	--	--	1	15	2	--	14	2	--	14	--
219.4	3	2	1	--	--	--	3	--	--	1	1	--	1	1	--	--	--	--	--	--	--	3	--	--	2	1	--	--	3	--	--	--	3	--	--	3	<1
219.5	16	1	16	--	--	<1	16	--	--	16	--	<1	16	--	--	--	3	--	--	--	--	16	<1	--	1	15	--	<1	16	--	3	--	13	3	--	13	--
Emma Park Variation Comparison																																					
Emma Park Variation Comparison	32	21	10	<1	--	13	7	3	9	32	--	<1	27	--	--	--	6	3	<1	2	--	32	<1	--	21	11	--	13	7	12	8	4	20	12	--	20	1
218	12	3	8	<1	--	--	<1	3	9	12	--	--	12	--	--	--	3	--	--	--	--	12	--	--	3	9	--	--	<1	12	3	--	9	3	--	9	1
219.1	1	1	--	--	--	--	1	--	--	1	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	--	1	--	--	--	1	--	--	1	<1
219.2	19	17	2	--	--	13	6	--	--	19	--	<1	14	--	--	--	3	3	<1	2	--	19	<1	--	17	2	--	13	6	--	5	4	10	9	--	10	--
Highway 191 Connector																																					
Highway 191 Connector	5	3	2	--	--	--	4	1	--	5	--	--	4	1	--	--	--	--	--	--	--	5	--	--	3	2	--	--	4	1	--	--	5	--	--	5	--
219.6	5	--	--	--	--	--	4	1	--	5	--	--	--	--	--	--	--	--	--	--	--	5	--	--	--	--	--	--	4	1	--	--	--	--	--	--	--

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
CastleDale Connector																																					
270	11	1	10	--	--	3	6	2	--	--	5	6	4	2	4	--	2	<1	--	--	--	3	1	6	1	4	6	1	4	6	2	<1	8	2	<1	8	2
Price Connector																																					
223	18	--	4	14	--	6	10	3	--	--	4	14	<1	7	12	--	4	<1	--	--	--	4	3	12	--	6	12	4	5	10	4	--	14	4	--	14	4
Lynndyl Connector																																					
400	24	3	21	--	--	7	10	7	--	--	9	15	--	18	6	--	<1	9	<1	--	--	9	15	--	3	21	--	7	10	7	9	<1	15	9	<1	15	1
IPP East Connector																																					
390	3	--	2	1	--	--	2	1	--	--	--	3	--	<1	2	--	2	1	--	--	--	--	3	--	--	3	--	--	2	1	3	--	--	3	--	--	--

1 High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

2 Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I**, **Table I-1**; **Appendix I**, **Figures I-2** and **I-3**).

3 BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I**, **Table I-5**; **Appendix I**, **Figure I-7**).

4 BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I**, **Table I-7**; **Appendix I**, **Figure I-8**).

5 USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

6 Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

7 Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

8 BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures in Appendix I**).

9 Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-22**.

Table 3.12-13 Region II Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative II-B				
210	26	--	--	26
211	8	--	--	8
212	13	--	--	13
213	13	--	--	13
320.05	24	--	--	24
320.1	74	--	--	74
320.15	28	--	--	28
320.2	7	--	--	7
340	20	--	--	20
360	26	--	--	26
430	18	--	--	18
Alternative II-B				
220.1	181	--	29	152
222.05	41	--	8	33
222.3	15	--	--	15
310	49	--	--	49
350	15	--	--	15
370	14	--	--	14
380	13	--	--	13
420	8	--	--	8
440	8	--	--	8
Alternative II-C				
220.1	181	--	29	152
225.2	38	--	2	36
330.1	99	--	--	99
410	37	--	--	37
440	8	--	--	8
Alternative II-D				
210	26	--	--	26
214	10	--	--	10
215	8	--	--	8
217.01	79	11	<1	67
217.02	16	13	--	3
217.1	21	--	1	20
217.15	36	--	--	36

Table 3.12-13 Region II Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
320.2	7	--	--	7
350	15	--	--	15
360	26	--	--	26
430	18	--	--	18
Alternative II-E				
210	26	--	--	26
213	13	--	--	13
214	10	--	--	10
215	8	--	--	8
217.05	7	--	--	7
215.051	21	--	--	21
217.052	16	--	--	16
320.05	24	--	--	24
320.15	28	--	--	28
320.2	7	--	--	7
325.1	43	5	--	38
325.2	4	3	--	1
350	15	--	--	15
360	26	--	--	26
430	18	--	--	18
Alternative II-F				
210	26	--	--	26
214	10	--	--	10
215	8	--	--	8
217.01	79	11	<1	67
217.052	17	1	--	16
218	12	12	--	--
219.1	1	1	--	--
219.2	20	20	--	<1
219.3	2	--	--	2
320.15	28	--	--	28
320.2	7	--	--	7
350	15	--	--	15
370	14	--	--	14
380	13	--	--	13
420	8	--	--	8

Table 3.12-13 Region II Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
440	8	--	--	8
Emma Park Variation				
217.02	16	13	--	3
219.4	2	1	--	1
219.5	17	17	--	<1
Emma Park Variation Comparison				
218	12	12	--	--
219.1	1	1	--	--
219.2	20	20	--	<1
Highway 191 Connector				
219.6	5	--	--	5
Castle Dale Connector				
270	11	--	--	11
Price Connector				
223	18	--	1	17
Lynndyl Connector				
400	24	--	<1	24
IPP East Connector				
390	3	--	--	3

Segment numbers depicted in **Figure 2-22**.

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-A	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-A	211	4wd Rd, Old Bonanza Hwy, Snake John Reef Cutoff Rd 0 Residences
II-A	212	Redwash Hwy, SR 45 0 Residences
II-A	213	Baeser Rd, Brennan Btm Rd, SR 88, Stirrup Rd, Wyasket Bottom Rd 0 Residences
II-A	320.05	1000w Rd, 1780w Rd, 2000 Rd, 2200 Rd, 2250 Rd, 2500 Rd, 2750 Rd, 3000s Rd, 3000w Rd, 3390 Rd, 3390s Rd, 3760s Rd, 4000s Rd, 4000w Rd, 4235s Rd, 4wd Rd, 5000 Rd, 6000w Rd, Cobble Hollow, Fort Duchesne Rd, Gusher Randlett Rd, Hilltop Rd, N 2100 Rd, S 1100 Rd, S 7000 Rd, S State St, US 40 150 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-A	320.1	13000 Rd, 3450s Rd, 36730 Rd, 418008 Uinta National Forest Roadless Area, 418015 Uinta National Forest Roadless Area, 418016 Uinta National Forest Roadless Area, 45000w Rd, 46000w Rd, 4wd Rd, 5000s Rd, Aspen Cove Campground, Burgess Blvd, Center St, Coke Rd, Coleman Dr, Colman Rd, Currant Creek Wildlife Management Area, Currant Creek WMA, Current Creek Rd, Deep Creek, Deep Creek Canyon, Double R Ranch, Forest Rd, Granite Blvd, Knoll Hollow, Little Baldy Mountain, Northwest Manti WMA, Rabbit Gulch Wildlife Management Area, Rays Valley Rd, Rd A, Sand Wash/Sink Draw, Sheep Creek Rd, Sink Draw, SR 208, SR 35, SR 87, Starvation State Park, Strawberry River Day Use Area, Strawberry River Day Use Area, Strawberry River WMA, Tabby Mountain WMA, Tank Hollow, US 40, US 6, Utahan Rd, White River/Strawberry Rd Scenic Backway, Wildcat Wildlife Management Area, Willow Creek 116 Residences
II-A	320.15	418028 Uinta National Forest Roadless Area, Cedar Knoll Manti-La Sal Roadless Area, Coal Hollow Manti-La Sal Roadless Area, Dispersed Camping Access Route, Dry Creek, Dry Hollow, Lake Fork & Dairy Fork Camping, Left Fork Spencer Canyon, North Nebo WMA, Northwest Manti WMA, Right Fork Spencer Canyon, Spencer Fork Wildlife Management Area, Spencer Fork--Lasson, Unnamed Campsite, US 89 15 Residences
II-A	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-A	340	1450 North St Rd, 740 North St, Andrews Spring Canyon, Canyon Hills Golf Course, Cazier Canyon, Cr Rd, E 1250 Rd, E 1450 Rd, E 700 Rd, E 770 Rd, Exit 228, Footes Canyon, Frontage Rd, Gardner Creek, Government Canyon, I-15, N 550 Rd, N 600 Rd, N 650 Rd, N 800 Rd, N 900 Rd, Nephi WMA, Quaking Asp Canyon, Ramp, Red Canyon, Salt Creek, Salt Spring Canyon, South Nebo WMA, SR 132, SR 41, SR 91, Sugarloaf, West Creek 99 Residences
II-A	360	Jericho Callao Rd, Little Sahara Recreation Area, RT 1812, SR 132, Tanner Creek, US 6 0 Residences
II-A	430	Desert Mountain Rd, N 6000 West St, SR 174 0 Residences
II-B	220.1	1 8/10 Rd, 2 8/10 Rd, 4th Rd, 4wd Rd, 5/10 Rd, 60th Rd, Atchee Ridge Rd, Badger Wash ACEC, Bitter Creek, Blaze Canyon, Bobcat Reservoir, Bryson Wash, Buttermilk Canyon, Cactus Reservoir, Coal Rd, CR 100, CR 104, CR 107, CR 108, CR 109, CR 112, CR 113, CR 114, CR 138, CR 201, CR 23, CR 25, CR 268, CR 65, CR 73, CR 78, Cr Rd, Crystal Geyser Overlook, Demaree Wildlife Study Area, Desolation Canyon WCR, Displacement Point, Exit 212, Exit 220, Flint Trl, Floy Wash Rd, Frontage Rd, Gillam Draw, Green River Overlook, I-70, Iron Wash Kiosk Site, Labyrinth Canyon SRMA, Labyrinth Rims/Gemini Bridges SRMA, Little Gillam Draw, Little Valley Rd, Lost Spring Wash, McInnis Canyons NCA, Mitchell Rd, Oil Spring Mountain ACEC, Oil Spring Mountain Wildlife Study Area, Old Hwy, Old Hwy Hanksville, Old Railroad Rd, Old Spanish Historic Trail, Park Canyon, Prairie Canyon, Railroad Rd, Ramp, Red Wash, San Arroyo Wash, Scullion Gulch, Sego Canyon Rd, Shale Dr, Side Canyon, South Canyon, Spring Canyon, Spring Creek, SR 128, SR 139, SR 64, SR 94, Thompson Canyon, US 6, Utah Rims SRMA, Villaroad Flats Reservoir, VRM Class 2 Scenic Corridor, Wagon Canyon, West Canyon, White River Riparian ACEC, Windy Mesa Rd 33 Residences
II-B	222.05	Cleveland Rd, Drop Wash, Farnham Rd, Marsh Flat Wash, Mathis Wash, Midway Reservoir, Mounds Rd, Mounds Reservoir, Mud Spring Rd, Never Sweat Wash WCR, Noviatt Ln, Price River WCR, SR 10, Upper Miller Creek Rd, Well Rd 2 Residences
II-B	222.3	Brockbank Hollow, Burma Rd, SR 122, SR 31, The Energy Loop: Huntington/Eccles Canyo, W 400 Rd 0 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-B	310	200 Rd, Arapeen OHV Area, Arapeen OHV Area, Arapeen OHV Area, Bear Mountain, Big Hollow Rd, Black Knob, Blue Slide Fork, Booths Canyon, Boulger - Black Canyon Manti-La Sal Rdl, Coal Fork, Cottonwood Camping, Cottonwood Creek Rd, Cottonwood Rd, Cove Creek Rd, Devils Peak, Dispersed Camping Access Route, Dublin Wash, East Mountain Manti-La Sal Roadless Area, Elk Canyon, Flat Canyon, Indian Creek Campground, Indian Creek GuaRd Station, Indian Creek Rd, Little North Creek, "Lower Millers Flat & Lowry Camping," Marinus Canyon, Meetinghouse Canyon, Miller Flat Rd, Moroni or Morris Cook, Mountainville Hwy, Mountainville Rd, Mule Creek, N 570 Rd, North Canyon, North Creek, North Fork Pleasant Creek, North Nebo WMA, Parley Ln, Pollys Peak, Potters Canyon, Potters Canyon Rd, "Potters Pond Campground", Rocky Ridge, Round Hills, Sanpitch Manti-La Sal Roadless Area, Skyline Dr, Skyline Drive Scenic Backway, Straight Fork, Unnamed Campsite, US 89, W 1780 Rd, Whetstone Creek 24 Residences
II-B	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence
II-B	370	Little Sage Valley, West Fork Reservoir 0 Residences
II-B	380	E 600 Rd, Railroad Ave, S 150 Rd, S Main St, SR 125, Taylors Flat Rd, W 400 Rd, W 600 Rd 0 Residences
II-B	440	Jones Rd, N 4000 Rd, N 8000 West St, W 8500 North St 0 Residences
II-C	220.1	1 8/10 Rd, 2 8/10 Rd, 4th Rd, 4wd Rd, 5/10 Rd, 60th Rd, Atchee Ridge Rd, Badger Wash ACEC, Bitter Creek, Blaze Canyon, Bobcat Reservoir, Bryson Wash, Buttermilk Canyon, Cactus Reservoir, Coal Rd, CR 100, CR 104, CR 107, CR 108, CR 109, CR 112, CR 113, CR 114, CR 138, CR 201, CR 23, CR 25, CR 268, CR 65, CR 73, CR 78, Cr Rd, Crystal Geyser Overlook, Demaree Wildlife Study Area, Desolation Canyon WCR, Displacement Point, Exit 212, Exit 220, Flint Trl, Floy Wash Rd, Frontage Rd, Gillam Draw, Green River Overlook, I-70, Iron Wash Kiosk Site, Labyrinth Canyon SRMA, Labyrinth Rims/Gemini Bridges SRMA, Little Gillam Draw, Little Valley Rd, Lost Spring Wash, McInnis Canyons NCA, Mitchell Rd, Oil Spring Mountain ACEC, Oil Spring Mountain Wildlife Study Area, Old Hwy, Old Hwy Hanksville, Old Railroad Rd, Old Spanish Historic Trail, Park Canyon, Prairie Canyon, Railroad Rd, Ramp, Red Wash, San Arroyo Wash, Scullion Gulch, Sego Canyon Rd, Shale Dr, Side Canyon, South Canyon, Spring Canyon, Spring Creek, SR 128, SR 139, SR 64, SR 94, Thompson Canyon, US 6, Utah Rims SRMA, Villaroad Flats Reservoir, VRM Class 2 Scenic Corridor, Wagon Canyon, West Canyon, White River Riparian ACEC, Windy Mesa Rd 33 Residences
II-C	225.2	Chimney Rock Flat, Dry Mesa, Job Corps Pond, Lost Spring Wash WCR, Lynns Pond, Old Spanish Historic Trail, Red Seep Wash, Saleratus Reservoir, San Rafael Canyon ACEC, Smith Pond, Summerville Point 0 Residences
II-C	330.1	3550 Rd, 4wd Rd, Aspen Hollow, Bar J Ranch, Browns Hole, Castle Valley Outdooors, Catamount Canyon, CR 801, CR 803, CR 805, CR 903, CR 906, CR 909, CR 912, CR 913, CR 916, Creepy Spring Rd, Crooked Canyon, Cutler Canyon, Dutch Flat Reservoir, Dutchmans Wash, E 11000 North St, E 1600 North St, E 2600 North St, E 300 Rd, E 3300 North St, E 3700 North St, E 400 Rd, E 4000 North St, E 5400 North St, F S 290, FS Rd, FS 037, FS 038, FS 047, FS 048, Goosberry Rd, Gooseberry/Fremont Rd Scenic Backway, I-70, Johnson Mountain Ranch, Klondike Canyon, Link Canyon Wash, Long Knoll, Lost Creek Rd, Molen Cutoff, Molen Seep Wash, N 8800 East St, N 9200 East St, N 9400 East St, Noon Rock Canyon, North Pavant Lake, Old Spanish Historic Trail, Old Woman Plateau, Paradise Ln, Pharo Canyon, Pharo Creek, Ranch Rd, Raspberry Canyon, Rock Art ACEC, Rocky Ford Canal Rd, Round Valley, Round Valley, S 100 Rd, S 200 Rd, S 300 Rd, S Old Hwy 89, Saddlehorse Canyon, Sage Flat Rd, San Rafael Swell SRMA, Santa Fe Creek, Sawmill Canyon, Shearing Corral Draw, South Wash, SR 10, SR 322, Telephone Hollow, The Breaks, US 50, US 89, Water Hollow, Wedge Overlook/Buckhorn Drive Scenic Bckwy 44 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-C	410	4wd Rd, Connecting Rd, DMAD Reservoir, DMAD Reservoir, E 4500 South St, East Fork Eightmile Creek, Exit 184, Frontage Rd, Graball Canyon, I-15, Long Canyon, N 400 West St, Ramp, Scipio Pioneer Trl, SR 100, SR 125, US 50, West Fork Eightmile Creek, Whisky Creek 1 Residence
II-C	440	Jones Rd, N 4000 Rd, N 8000 West St, W 8500 North St 0 Residences
II-D	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-D	214	4wd Rd 0 Residences
II-D	215	Glen Bench Rd, SR 45 0 Residences
II-D	217.01	0401009 Ashley National Forest Roadless Ar, 4wd Rd, 9 Mile Canyon Rd, 9 Mile Rd, Argyle Canyon Rd, Camping Unit, Enron Middle Campsite, Enron North Campsite, Enron South Campsite, Glen Bench Rd, Lears Canyon ACEC, Lower Green River ACED, Lower Green River WSR (VFO) Wildlife Stu, Mountain Fuel Bridge, Nine Mile Canyon Scenic Backway, Nine Mile SRMA, Ninemile ACEC, Seep Ridge Rd, The Squeeze, Turkey Trl, Watson Rd, White River Raft Access 0 Residences
II-D	217.02	2 Industrial Buildings, 4wd Rd, 7 Outbuildings, Badger Canyon, Big Sulphur Canyon Rd, Butchers Rd, Camp Site, Dry Fork, Lion Canyon, Minnie Maud Creek Rd, Minnie Maud Ridge, Pasture Canyon, Pole Canyon, Sams Canyon Rd, Sky-high Pond, Wash Canyon, Whitmore Park Rd 16 Residences
II-D	217.1	1 Industrial Building, 5th Rd, 9th Rd, Arriotti Rd, Castle Gate Dr, Castle Gate Rd, Cedar Bench Rd, Deep Canyon, Dinosaur Diamond Prehistoric Byway, Dry Canyon, Dry Canyon Rd, Dump Rd, Frontage Rd, Gentile Wash, Gordon Creek WMA, Gun Club Rd, Gun Range Rd, Hardscrabble Canyon, Hardscrabble Canyon Rd, Hardscrabble Rd, Helper Dr, Jack Canyon, Ketchum Rd, Mathis Canyon, Mathis Canyon Rd, Minnie Maud Ridge, Mountain Rd, N Lincoln Rd, N Main St, N Martin Rd, Orchard St, Panther Canyon, Panther Canyon Rd, Pipeline Bench, Pit Rd, Power Plant Rd, Price Canyon, Red Diamond Rd, Rock Rd, Royal St, Royal Way, S 4th Ave, S 5th Ave, Shooters Aly Rd, Spring Canyon Cir, Spring Canyon Rd, SR 139, The Flats, Trestle Rd, Upper Fish Rd, US 191, US 6, W 100 Rd, W 1000 Rd, W 200 Rd, W 300 Rd, W 400 Rd, W 500 Rd, W 600 Rd, W 700 Rd, W 800 Rd, W 900 Rd, Waldo Rd, Whitmore Park Rd 0 Residences
II-D	217.15	Barn Canyon, Benches Rd, Blind Fork, Boarding House Canyon Rd, Boardinghouse Canyon, Boneyaroad Canyon, Broads Canyon Rd, Burnt Fork, Castle Valley Ridge Rd, Dispersed Camping Access Route, Dry Creek, Finn Canyon, Finn Canyon Rd, Hill Top Rd, Hys Fork, Lone Rock Ravine, Magazine Canyon, Maple Fork, Milburn Rd, Narrows Tunnel, North Fork Swens Canyon, North Skyline Winter Staging, Northwest Manti WMA, Oak Creek Manti-La Sal Roadless Area, Peterson Ln, S Fork Eccles Creek Rd, Skyline Dr, SR 264, SR 31, SR 96, Swens Canyon, The Elbow, Tough Springs Rd, Trail Canyon Rd, Unnamed Campsite, US 89, Wasatch Academy SUP School, White Pine Fork 0 Residences
II-D	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-D	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence
II-D	360	Jericho Callao Rd, Little Sahara Recreation Area, RT 1812, SR 132, Tanner Creek, US 6 0 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-D	430	Desert Mountain Rd, N 6000 West St, SR 174 0 Residences
II-E	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-E	213	Baeser Rd, Brennan Btm Rd, SR 88, Stirrup Rd, Wyasket Bottom Rd 0 Residences
II-E	214	4wd Rd 0 Residences
II-E	215	Glen Bench Rd, SR 45 0 Residences
II-E	215.05	Siddoways Reservoir 0 Residences
II-E	217.051	1 Gas Station, 3 Industrial Buildings, 5 Dispersed Camping, 5 Outbuildings, Emma Park, Horse Creek Rd, Indian Canyon Scenic Byway, Jack Canyon Rd, Kyune Creek, Quarry Rd, Scofield Canyons, Soldier Summit, Spring Canyon, SR 96, Tabbyune Canyon, Tabbyune Creek, US 191, US 6, White River, Woods Canyon 8 Residences
II-E	217.052	19 Dispersed Camping, Center St, Cleary St, Cottonwood Canyon, Davidson Canyon, Garner Canyon, Garner Hollow, Great Western South, Heslington Canyon, Hicks Canyon, Indian Creek, Northwest Manti WMA, Oak St, Pine St, Private Picnic Site, Sheep Creek, Sheep Creek (Snowmobile), Spring Canyon, Tie Fork, Viaduct St 7 Residences
II-E	320.05	1000w Rd, 1780w Rd, 2000 Rd, 2200 Rd, 2250 Rd, 2500 Rd, 2750 Rd, 3000s Rd, 3000w Rd, 3390 Rd, 3390s Rd, 3760s Rd, 4000s Rd, 4000w Rd, 4235s Rd, 4wd Rd, 5000 Rd, 6000w Rd, Cobble Hollow, Fort Duchesne Rd, Gusher Randlett Rd, Hilltop Rd, N 2100 Rd, S 1100 Rd, S 7000 Rd, S State St, US 40 150 Residences
II-E	320.15	418028 Uinta National Forest Roadless Area, Cedar Knoll Manti-La Sal Roadless Area, Coal Hollow Manti-La Sal Roadless Area, Dispersed Camping Access Route, Dry Creek, Dry Hollow, Lake Fork & Dairy Fork Camping, Left Fork Spencer Canyon, North Nebo WMA, Northwest Manti WMA, Right Fork Spencer Canyon, Spencer Fork Wildlife Management Area, Spencer Fork--Lasson, Unnamed Campsite, US 89 15 Residences
II-E	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-E	325.1	0401010 Ashley National Forest Roadless Ar, 0401011 Ashley National Forest Roadless Area, 10000w Rd, 101060w Rd, 11000w Rd, 11490w Rd, 4 Outbuildings, 4000 Rd, 4725 Rd, 4725s Rd, 4730s Rd, 6000 Rd, 6000s Rd, 6450s Rd, 7 Dispersed Camping, 8000 Rd, 9000 Rd, 9000s Rd, 9000w Rd, 9500w Rd, Antelope Canyon Rd, Antelope Creek, Broad Hollow, Clem Hollow, Corral Hollow, Deathtrap Canyon, E River Rd, Indian Canyon WMA, Jolie Hollow, Lance Canyon, Mine Hollow, North Lost Hollow, North Twin Hollow, Quitchampau Canyon, Rd Hollow, South Lost Hollow, South Twin Hollow, Sowers Canyon Rd, Spring Hollow, SR 87, Tabby Canyon, Trail Hollow, Trapper Canyon, US 40, Walkway, Wire Fence Canyon, Y Canyon 63 Residences
II-E	325.2	3 Dispersed Camping, Timberlane Camp, Timberlane Camp Rd 1 Residence
II-E	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-E	360	Jericho Callao Rd, Little Sahara Recreation Area, RT 1812, SR 132, Tanner Creek, US 6 0 Residences
II-E	430	Desert Mountain Rd, N 6000 West St, SR 174 0 Residences
II-F	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-F	214	4wd Rd 0 Residences
II-F	215	Glen Bench Rd, SR 45 0 Residences
II-F	217.01	0401009 Ashley National Forest Roadless Area, 4wd Rd, 9 Mile Canyon Rd, 9 Mile Rd, Argyle Canyon Rd, Camping Unit, Enron Middle Campsite, Enron North Campsite, Enron South Campsite, Glen Bench Rd, Lears Canyon ACEC, Lower Green River ACED, Lower Green River WSR (VFO) Wildlife Stu, Mountain Fuel Bridge, Nine Mile Canyon Scenic Backway, Nine Mile SRMA, Ninemile ACEC, Seep Ridge Rd, The Squeeze, Turkey Trl, Watson Rd, White River Raft Access 0 Residences
II-F	217.052	19 Dispersed Camping, Center St, Cleary St, Cottonwood Canyon, Davidson Canyon, Garner Canyon, Garner Hollow, Great Western South, Heslington Canyon, Hicks Canyon, Indian Creek, Northwest Manti WMA, Oak St, Pine St, Private Picnic Site, Sheep Creek, Sheep Creek (Snowmobile), Spring Canyon, Tie Fork, Viaduct St 7 Residences
II-F	218	2 Outbuildings, 4 Dispersed Camping, Argyle Ridge 14 Residences
II-F	219.2	0401012 Ashley National Forest Roadless Area, 0401013 Ashley National Forest Roadless Area, 2 Outbuildings, 26 Dispersed Camping, 418019 Uinta National Forest Roadless Area, 4wd Rd, Amphitheatre, Argyle Canyon Rd, Avintaquin Family Campground, Cat Peak, Dock, Horse Rd, Indian Head, Res Ridge Rd, Reservation Ridge, Reservation Ridge Scenic Backway 49 Residences
II-F	219.3	1 Utility Structure, 1 Gas Station, East St, Left Fork White River, Right Fork White River, Soldier Summit (Snowmobile), Timber Canyon Rd 4 Residences
II-F	320.15	418028 Uinta National Forest Roadless Area, Cedar Knoll Manti-La Sal Roadless Area, Coal Hollow Manti-La Sal Roadless Area, Dispersed Camping Access Route, Dry Creek, Dry Hollow, Lake Fork & Dairy Fork Camping, Left Fork Spencer Canyon, North Nebo WMA, Northwest Manti WMA, Right Fork Spencer Canyon, Spencer Fork Wildlife Management Area, Spencer Fork--Lasson, Unnamed Campsite, US 89 15 Residences
II-F	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-F	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence
II-F	370	Little Sage Valley, West Fork Reservoir 0 Residences
II-F	380	E 600 Rd, Railroad Ave, S 150 Rd, S Main St, SR 125, Taylors Flat Rd, W 400 Rd, W 600 Rd
II-F	440	Jones Rd, N 4000 Rd, N 8000 West St, W 8500 North St 0 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
Emma Park Alternative Variation	217.02	2 Industrial Buildings, 4wd Rd, 7 Outbuildings, Badger Canyon, Big Sulphur Canyon Rd, Butchers Rd, Camp Site, Dry Fork, Lion Canyon, Minnie Maud Creek Rd, Minnie Maud Ridge, Pasture Canyon, Pole Canyon, Sams Canyon Rd, Sky-high Pond, Wash Canyon, Whitmore Park Rd 16 Residences
Emma Park Alternative Variation	219.4	West Fork Willow Creek 0 Residences
Emma Park Alternative Variation	219.5	2 Dispersed Camping, Anderson Hollow, Logge Canyon, Right Fork Kyune Creek 0 Residences
Emma Park Alternative Variation Comparison	218	2 Outbuildings, 4 Dispersed Camping, Argyle Ridge 14 Residences
Emma Park Alternative Variation Comparison	219.2	0401012 Ashley National Forest Roadless Ar, 0401013 Ashley National Forest Roadless Area, 2 Outbuildings, 26 Dispersed Camping, 418019 Uinta National Forest Roadless Area, 4wd Rd, Amphitheatre, Argyle Canyon Rd, Avintaquin Family Campground, Cat Peak, Dock, Horse Rd, Indian Head, Res Ridge Rd, Reservation Ridge, Reservation Ridge Scenic Backway 49 Residences
Highway 191 Alternative Connector	219.6	Jones Hollow 0 Residences
Castle Dale Alternative Connector	270	4wd Rd, Lawrence County Rd, SR 10 0 Residences
Price Alternative Connector	223	Benches Rd, Bob Wright Canyon, Hiawatha, Horse Bench, Long Bench Rd, Mine Property Line, Mud Water Canyon, N Spring Canyon Rd, N Spring Rd, Telephone Bench Rd, The Knoll, Wattis Hwy, Wattis Rd, Wiregrass Bench Rd 0 Residences
Lynndyl Alternative Connector	400	4wd Rd, Frontage Rd, Hard Scrabble Canyon Rd, I-15, Leamington Pass Rd, Little Oak Creek Rd, Middle Canyon, Murrays Canyon, Oak Creek Canyon Rd, Spring Canyon 0 Residences

Segment numbers depicted in **Figure 2-22**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above 4 feet in height would occur in the 250-foot-wide ROW unless otherwise specified in the PDTR. Only the 90-foot-wide “wire zone” and 250-foot-square structure construction area would be cleared in corridors classified as VRM Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 309 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-10**. The results are central components in **Table 3.12-14**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region II are portrayed by tables and maps of scenic quality classes (**Appendix I**, **Table I-1** and **Figure I-2**), sensitivity levels (**Appendix I**, **Table I-2** and **Figure I-4**), visual resource inventory classes (**Appendix I**, **Table I-5** and **Figure I-7**), and visual resource management classes (**Appendix I**, **Table I-6** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery,

sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 176 KOPs selected, photographed, and analyzed in Region II. The KOP figures in **Appendix I** portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation. Twenty-three photographic simulations of the Project in Region II, for those KOP locations where agency management objectives would not be met, are shown in the tables in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures **Appendix I**.

Alternative II-A (Applicant Proposed)

Alternative II-A would cross 257 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, CO State Highway 64 just south of Dinosaur, the Green River just south of The Stirrup, U.S. 40 southwest of Roosevelt and again in Deer Creek Canyon, Utah State Highway 87, Strawberry Road Scenic Backway, U.S. 6, U.S. 89, Utah State Highway 132 east of Nephi, in addition to several recreational roads and trails (**Table 3.12-14**). It would cross Utah State Highway 132 west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174 in areas where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually (higher contrasts) more than they would if seen with existing transmission line structures.

Recreationally important landscapes include Dinosaur National Monument, Bottle Hollow Reservoir, Starvation Reservoir, Strawberry Reservoir, Aspen Cove Campground, Strawberry River Day Use Area, and Strawberry Road Scenic Backway and camping areas, where the Project's structures would be seen with existing transmission line structures or oil and gas facilities. The Project would be visible from the Little Sahara Recreation Area and associated sand dunes areas where guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur NM, White River, Vernal, Uinta, Salt Lake, Richfield, and Fillmore FO sections.

Alternative II-A would be visible in the immediate foreground from 380 residences. Thirty-eight percent of Alternative II-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-four percent of Alternative II-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). One percent of Alternative II-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative II-A has increased impacts as compared with Alternative II-E. Alternative II-A has decreased impacts as compared with Alternative II-B, Alternative II-C, Alternative II-D, and Alternative II-F. Eleven percent of the Alternative II-A reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Cedar Knoll IRA Micro-siting Options could be utilized with similar results as those discussed under Alternative II-F.

Strawberry IRA Micro-siting Option 1

This option is similar to Alternative II-A, except that it would cross the Strawberry Road Scenic Backway immediate foreground viewshed nearer to the existing transmission line. Thus, it has decreased impacts as compared with Alternative II-A. Four percent of the Strawberry IRA Micro-siting Option 1 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Strawberry IRA Micro-siting Option 2

This option is similar to Alternative II-A, except that it would cross the Strawberry Road Scenic Backway immediate foreground viewshed nearer to the existing transmission line. However, it has two additional, substantially more dominant, self-supported structures at the road crossing near Little Baldy Mountain. These features would stand out visually and have increased visual impacts. Thus, it has increased impacts as compared with Alternative II-A. Four percent of the Strawberry IRA Micro-siting Option 2 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Strawberry IRA Micro-siting Option 3

This option is similar to Alternative II-A, except that it would cross over or under the existing transmission line in the Strawberry Road Scenic Backway immediate foreground viewshed and has at least four additional, substantially more dominant, self-supported structures at the road crossings near Little Baldy Mountain and Buffalo Canyon. These features would stand out visually and have increased visual impacts. Thus, this option has increased impacts as compared with Alternative II-A. Four percent of the Strawberry IRA Micro-siting Option 3 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-B

Alternative II-B would cross 345 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (Section 3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from CO State Highway 64 east of Rangely, CO State Highway 139 south of Rangely, the Crystal Geyser Road and Green River south of the town of Green River, I-70 west of Green River, would closely parallel U.S. 6 from I-70 to near the Carbon County/Emery County line, the Upper Joe's Valley Road, Skyline Road Backway, U.S. 89, Utah State Highway 132, U.S. 6 near Lynndyl, and Utah State Highway 174, in addition to several recreational roads and trails (**Table 3.12-14**). It does not parallel existing transmission lines as it would cross the Old Spanish Trail and I-70 west of the Green River to the Colorado/Utah border, and would cross and would closely parallel the winding Baxter Pass Road from near the Garfield County/Mesa County border over Baxter Pass to the White Face Butte area where the Project's predominantly self-supported structures would be "sky-lined" for the majority of the distance. It also would cross Rangely Dragon Road, Texas Creek recreational roads and trails, Utah State Highway 10, Utah State Highway 31, and I-15 in areas where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually (higher contrasts) more than they would if seen with existing transmission line structures and oil and gas structures.

Recreationally important landscapes include the Texas Creek area, Baxter Pass area, Cisco Desert area, Green River area, Cedar Mountain area, and Joe's Valley area, where guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur NM, White River, Grand Junction, Moab, Price, Richfield, and Fillmore FO sections.

Alternative II-B would be visible in the immediate foreground from 60 residences. Twenty-eight percent of Alternative II-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twelve percent of Alternative II-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**).

Four percent of Alternative II-B would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-B has decreased impacts as compared with Alternative II-C and Alternative II-F, and all the alternatives have increased impacts as compared with Alternative II-A, Alternative II-D, and Alternative II-E. Forty-one percent of the Alternative II-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-C

Alternative II-C would cross 364 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross along with one or more existing transmission lines (reduced contrasts) in the view from CO State Highway 64 east of Rangely, CO State Highway 139 south of Rangely, the Crystal Geyser Road and Green River south of the town of Green River, I-70 west of Green River, would closely parallel U.S. 6 from I-70 to the intersection with the Green River Cutoff Road, Wedge Overlook Road, Utah State Highway 10, I-70, Gooseberry Road, U.S. 70, U.S. 50, I-15, would closely parallel U.S.50, and would cross U.S. 6. At the intersection of the Green River Cutoff Road it aligns west through complex and highly scenic surface geology where it would predominantly consist of self-supported structures that would be "sky-lined" along the roadway to the Cedar Mountain area, in addition to several local recreational roads and trails (**Table 3.12-14**). It does not parallel existing transmission lines as it would cross and would closely parallel the Rangely Dragon Road, Texas Creek recreational roads and trails, the winding Baxter Pass Road (where predominantly self-supporting structures would be required) from near the White Face Butte area over Baxter Pass to the Garfield County/Mesa County and would parallel the Old Spanish Trail and I-70 from the Colorado/Utah Border to the crossings just east of Green River. All of these locations would be subject to "sky-lining" of the Project's guyed and self-supported structures.

Recreationally important landscapes include the Texas Creek area, Baxter Pass area, Cisco Desert area, and U.S. 6 to Cedar Mountain area, Wedge Overlook area, Saleratus Benches area, Gooseberry Road area, Maple Grove Campground area, Scipio Lake area, and Canyon Mountains area, where guyed and self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur NM, White River, Grand Junction, Moab, Price, Richfield, Fishlake and Fillmore FO sections.

Alternative II-C would be visible in the immediate foreground from 78 residences. Twenty-three percent of Alternative II-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Less than 1 percent of Alternative II-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of Alternative II-C would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but

should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-C has increased impacts as compared with Alternative II-A, Alternative II-B, Alternative II-D, and Alternative II-E. Alternative II-C has decreased impacts as compared with Alternative II-F. Thirty-nine percent of the Alternative II-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-D

Alternative II-D would cross 262 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (Section 3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, Colorado State Highway 64 just south of Dinosaur, the Chapita Wells Gas Field area, and U.S. 6. It would cross with higher contrasts the White River near the Enron Boat Takeout spot, the Uintah and Ouray Indian Reservation, the Green River, Sand Wash Road, Nine Mile Canyon Scenic Backway, Argyle Canyon Road, would closely parallel U.S. 191, Energy Loop Scenic Byway north of Clear Creek, again near Fairview Lakes, and again east of Fairview, U.S. 89 north of Fairview, Utah State Highway 132 east and west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174, in addition to numerous recreational roads and trails (**Table 3.12-14**).

Recreationally important landscapes include Dinosaur National Monument, Fantasy Canyon, White River, Green River, Electric Lake, Fairview Lakes and the Little Sahara Recreation Area and associated sand dunes areas where guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur National Monument, White River, Vernal, Manti La Sal, Richfield, and Fillmore FO sections.

Alternative II-D would be visible in the immediate foreground from 17 residences. Thirty-nine percent of Alternative II-D would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eighteen percent of Alternative II-D would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Three percent of Alternative II-D would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-D has increased impacts as compared with Alternative II-A and Alternative II-E due to the (Alternative II-D) crossings of Electric Lake and Fairview Lakes areas. Alternative II-D has decreased impacts as compared with Alternative II-B, Alternative II-C, and Alternative II-F. Thirty-one percent of the Alternative II-D reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-E

Alternative II-E would cross 266 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (3.12.5.4), High Plateaus of Utah Section of the

Colorado Plateaus Province (Section 3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, CO State Highway 64 just south of Dinosaur, the Green River just south of The Stirrup, U.S. 40 southwest of Roosevelt, Sowers Canyon Road, Argyle Canyon Road, the LDS Camp Timberlane, U.S. 6 in Soldier Canyon, Utah State Highway 87, Strawberry Road Scenic Backway, U.S. 6, U.S. 89, Utah State Highway 132 east of Nephi, in addition to several recreational roads and trails (**Table 3.12-14**). It would cross Utah State Highway 132 west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174 in areas where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually (higher contrasts) more than they would if seen with existing transmission line structures.

Recreationally important landscapes include Dinosaur National Monument, Bottle Hollow Reservoir, Sowers Canyon, Argyle Canyon, and the LDS Camp Timberland, where the Project's structures would be seen with existing transmission line structures. The Project would be visible from the Little Sahara Recreation Area and associated sand dunes areas where guyed and self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur National Monument, White River, Vernal, Ashley, Uinta, Salt Lake, Richfield, and Fillmore FO sections.

Alternative II-E would be visible in the immediate foreground from 245 residences. Forty percent of Alternative II-E would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-five percent of Alternative II-E would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of Alternative II-E would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-E has decreased impacts as compared with Alternative II-A, Alternative II-B, Alternative II-C, Alternative II-D, and Alternative II-F. Twenty-seven percent of the Alternative II-E reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Cedar Knoll IRA Micro-siting Options could be utilized with similar results as those discussed under Alternative II-F.

Alternative II-F (Agency Preferred)

Alternative II-F would cross 267 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (Section 3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, Colorado State Highway 64 just south of Dinosaur, the Chapita Wells Gas Field area, and U.S. 6. It would cross with higher contrasts the White River near the Enron Boat Takeout spot, the Uintah and Ouray Indian Reservation, the Green River, Sand Wash Road, Nine Mile Canyon Scenic Backway, Argyle Canyon Road, access road to the LDS Camp Timberlane, U.S. 191, (parallel and cross) the Reservation Ridge Scenic Backway, U.S. 6, Utah State Highway 132 east and west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174, in addition to numerous recreational roads and trails (**Table 3.12-14**).

Recreationally important landscapes include Dinosaur National Monument, Fantasy Canyon, White River, Green River, the LDS Camp Timberlane, Reservation Ridge Scenic Backway, USFS Avintaquin Campground, and the Little Sahara Recreation Area and associated sand dunes areas where guyed and self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur National Monument, White River, Vernal, Manti La Sal, Richfield, and Fillmore FO sections.

Alternative II-F would be visible in the immediate foreground from 90 residences. Forty-eight percent of Alternative II-F would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-seven percent of Alternative II-F would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Three percent of Alternative II-F would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-F has substantially increased impacts as compared with Alternative II-A, Alternative II-B, Alternative II-C, Alternative II-D, and Alternative II-E. The Argyle Ridge and Reservation Ridge locations cause the highest impacts to landscape scenery and to high sensitivity viewers of all Project alternatives (Region I, Region II, Region III, and Region IV). Field photography, preparation of visual contrast worksheets, and visual simulations will be completed for the Final EIS. Thirty-five percent of the Alternative II-F reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Cedar Knoll IRA Micro-siting Option 1

The Cedar Knoll IRA Micro-siting Option 1 would cross 28 miles of landscapes along the boundaries of the Middle Rocky Mountains Province (Section 3.12.5.4), Great Basin Section of the Basin and Range Province (Section 3.12.5.6), and High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross U.S. 89 along with an existing transmission line and would be “sky-lined” (increased impact) in that area. The community of Birdseye and historic town of Thistle would have visibility of the Project in their vicinities. The Cedar Knoll IRA Micro-siting Option 1 would be visible in the immediate foreground from zero residences.

Ninety-three percent of the Cedar Knoll IRA Micro-siting Option 1 would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Thirty-nine percent of the Cedar Knoll IRA Micro-siting Option 1 would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of the Cedar Knoll IRA Micro-siting Option 1 would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Cedar Knoll IRA Micro-siting Option 1 would have impacts over its reach comparable to Alternative II-A. None of the Cedar Knoll IRA Micro-siting Option 1 reference line would be located within a utility corridor or utility window.

Cedar Knoll IRA Micro-siting Option 2

The Cedar Knoll IRA Micro-siting Option 2 would cross 28 miles of landscapes along the boundaries of the Middle Rocky Mountains Province (Section 3.12.5.4), Great Basin Section of the Basin and Range Province (Section 3.12.5.6), and High Plateaus of Utah Section of the Colorado Plateaus Province

(Section 3.12.5.5). It would cross U.S. 89 along with an existing transmission line and would be “sky-lined” (increased impact) in that area. The community of Birdseye and historic town of Thistle would have visibility of the Project in their vicinities. It would require near U.S. 89 at least five additional, substantially more dominant, self-supported structures as compared with other alternatives in this viewshed. The Cedar Knoll IRA Micro-siting Option 2 would be visible in the immediate foreground from zero residences.

Ninety-three percent of the Cedar Knoll IRA Micro-siting Option 2 would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Forty-three percent of the Cedar Knoll IRA Micro-siting Option 2 would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of the Cedar Knoll IRA Micro-siting Option 2 would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Cedar Knoll IRA Micro-siting Option 2 would have increased impacts over its reach as compared with Alternative II-A and Cedar Knoll IRA Micro-siting Option 2. None of the Cedar Knoll IRA Micro-siting Option 2 reference line would be located within a utility corridor or utility window.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation would cross 35 miles of landscapes in the Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross U.S. Highway 191 and three places along the access road to a camp, and would be “sky-lined” (increased impact) in those areas. The Emma Park Alternative Variation would be visible in the immediate foreground from 79 residences. Ninety-seven percent of the Emma Park Alternative Variation would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eleven percent of the Emma Park Alternative Variation would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the Emma Park Alternative Variation would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Emma Park Alternative Variation would have increased impacts as compared to Alternative II-E and substantially decreased impacts as compared to Alternative II-F. Field photography, preparation of visual contrast rating worksheets, and visual simulations will be completed for the Final EIS. Less than 1 percent of the Emma Park Variation reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative Connectors in Region II

Highway 191 Alternative Connector

The Highway 191 Alternative Connector would cross 5 miles of landscapes in the Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross U.S. and would be “sky-lined” (increased impact) in that area. The Highway 191 Alternative Connector would be visible in the immediate foreground from zero residences. One hundred percent of the Highway 191 Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixty percent of the Highway 191 Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations

(**Table 3.12-14**). All of the Highway 191 Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Highway 191 Alternative Connector would have increased impacts as compared to Alternative II-E and substantially decreased impacts as compared to Alternative II-F. Field photography, preparation of visual contrast rating worksheets, and visual simulations will be completed for the Final EIS. None of the Highway 191 Connector reference line would be located within a utility corridor or utility window.

Price Alternative Connector

The Price Connector would cross 18 miles of landscapes in the Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross the Wattis Road along with a pair of existing transmission lines and would be “sky-lined” (increased impact) in that area. It would closely parallel these steel lattice transmission lines for the majority of the route. The Price Connector would be visible in the immediate foreground from zero residences. Twenty-two percent of the Price Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of the Price Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the Price Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Price Connector would have decreased impacts over its reach, but would involve the increased impacts of Alternative II-B. Twenty-two percent of the Price Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Castle Dale Alternative Connector

The Castle Dale Alternative Connector would cross 11 miles of landscapes in the Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross Utah State Highway 10 in an area with existing transmission lines and would be “sky-lined” in that area. It would cross in front of Red Point, a major visual landmark in the Huntington area. The Castle Dale Alternative Connector would be visible in the immediate foreground from zero residences. Twenty-seven percent of the Castle Dale Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Nine percent of the Castle Dale Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of the Castle Dale Alternative Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Castle Dale Alternative Connector would have decreased impacts over its reach, but would involve the increased impacts of Alternatives II-B and II-C. Eighteen percent of the Castle Dale Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Lynndyl Alternative Connector

The Lynndyl Alternative Connector would cross 24 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross numerous recreational roads and trails (**Table 3.12-14**) and would be “sky-lined” (increased impact) in those areas with no other transmission

lines present. The Lynndyl Alternative Connector would be visible in the immediate foreground from one residence. Thirty-eight percent of the Lynndyl Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Thirteen percent of the Lynndyl Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the Lynndyl Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Lynndyl Alternative Connector would have increased impacts over its reach. Four percent of the Lynndyl Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

IPP Alternative Connector

The IPP Alternative Connector would cross 3 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross no roads or trails. The IPP Alternative Connector would be visible in the immediate foreground from zero residences. None of the IPP Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of the IPP Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the IPP Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The IPP Alternative Connector would have minimal impacts over its reach. None of the IPP East Connector reference line would be located within a utility corridor or utility window.

3.12.6.6 Region III

Impact parameters relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and specific differences by alternative are presented below. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual Impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-15**. Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**.

The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

<u>Residual Impacts</u>

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-15**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, “walking the line”) are listed in the corresponding tables in **Appendix I**.

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative III-A																																					
Alternative III-A Total	**276**	**32**	**82**	**69**	**93**	**52**	**93**	**72**	**59**	**1**	**101**	**174**	**17**	**90**	**150**	**3**	**73**	**132**	**1**	**16**	**--**	**60**	**60**	**156**	**23**	**70**	**182**	**25**	**73**	**178**	**219**	**7**	**50**	**220**	**6**	**50**	**68**
450	11	--	4	6	2	2	7	2	--	--	--	11	--	10	1	--	--	11	--	--	--	--	2	9	--	<1	11	1	3	8	11	--	<1	11	--	<1	--
470	34	1	4	5	24	1	5	11	16	--	13	21	--	3	31	--	--	31	--	--	--	13	21	--	1	9	24	1	5	27	31	--	3	31	--	3	2
480	65	2	14	28	21	21	19	25	--	--	15	50	--	9	56	--	--	53	--	--	--	1	9	56	--	6	59	8	15	42	53	--	12	53	--	12	--
500	19	--	--	2	17	1	8	7	3	--	--	19	--	--	19	--	--	12	--	--	--	--	--	19	--	--	19	--	1	18	12	--	8	12	--	8	1
500.02	18	<1	11	3	4	10	6	2	--	--	2	16	--	3	15	--	--	2	--	--	--	--	--	18	--	<1	17	--	10	8	2	--	15	2	--	15	--
500.05	10	7	3	--	--	2	3	5	--	--	8	2	--	3	5	--	--	3	--	1	--	6	<1	3	5	3	2	2	1	6	5	--	5	5	--	5	2
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13
501.15	1	1	--	--	--	--	1	--	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	1	--	--	--	1	1	--	--	1	--	--	1
502.05	43	3	11	9	19	1	5	6	30	--	25	18	2	22	16	--	25	12	--	2	--	9	1	33	3	7	33	1	4	38	39	--	4	39	--	4	36
530	9	--	--	3	5	--	--	--	9	--	2	6	2	5	1	2	--	6	--	--	--	--	--	9	--	--	9	--	--	9	9	--	--	9	--	--	6
550	35	2	22	12	--	6	22	6	1	--	23	12	12	18	4	1	31	2	--	--	--	21	12	3	2	31	3	6	22	7	34	--	1	34	--	1	2
560	11	3	9	--	--	1	5	5	--	--	<1	11	<1	11	--	--	11	--	--	--	--	<1	11	--	3	9	--	1	5	5	9	2	--	9	2	--	--
600	6	<1	4	1	--	--	3	2	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	<1	5	--	--	6	6	--	--	6	--	--	6
Alternative III-B																																					
Alternative III-B Total	**285**	**22**	**99**	**106**	**58**	**84**	**92**	**48**	**61**	**13**	**85**	**187**	**26**	**75**	**169**	**3**	**64**	**144**	**--**	**--**	**--**	**59**	**100**	**126**	**14**	**117**	**154**	**55**	**67**	**163**	**211**	**1**	**73**	**211**	**1**	**73**	**79**
450	11	--	4	6	2	2	7	2	--	--	--	11	--	10	1	--	--	11	--	--	--	--	2	9	--	<1	11	1	3	8	11	--	<1	11	--	<1	--
470	34	1	4	5	24	1	5	11	16	--	13	21	--	3	31	--	--	31	--	--	--	13	21	--	1	9	24	1	5	27	31	--	3	31	--	3	2
480	65	2	14	28	21	21	19	25	--	--	15	50	--	9	56	--	--	53	--	--	--	1	9	56	--	6	59	8	15	42	53	--	12	53	--	12	--
490	14	--	2	12	--	1	12	--	--	--	--	14	--	--	14	--	--	5	--	--	--	--	14	--	--	14	--	1	12	--	5	--	9	5	--	9	--
490.05	42	7	29	7	--	37	5	--	--	--	1	42	--	1	42	--	2	8	--	--	--	1	42	--	7	35	--	37	5	--	10	<1	33	10	<1	33	--

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
510	57	6	23	24	4	7	11	3	36	13	32	12	13	25	19	--	27	28	--	--	--	44	12	--	6	47	4	7	11	38	55	1	1	55	1	1	26
530	9	--	--	3	5	--	--	--	9	--	2	6	2	5	1	2	--	6	--	--	--	--	--	9	--	--	9	--	--	9	9	--	--	9	--	--	6
540	40	4	14	19	2	13	21	5	1	--	22	18	11	9	5	1	22	2	--	--	--	--	--	40	--	4	36	--	13	27	25	--	14	25	--	14	34
590	7	1	6	<1	--	1	6	--	--	--	--	7	--	7	<1	--	7	--	--	--	--	--	--	7	--	1	6	--	1	6	7	--	--	7	--	--	4
600	6	<1	4	1	--	--	3	2	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	<1	5	--	--	6	6	--	--	6	--	--	6
Alternative III-C																																					
Alternative III-C Total	**308**	**51**	**106**	**83**	**68**	**109**	**81**	**72**	**46**	**11**	**96**	**201**	**28**	**66**	**209**	**--**	**92**	**146**	**--**	**--**	**--**	**82**	**111**	**115**	**42**	**131**	**135**	**89**	**64**	**155**	**229**	**8**	**71**	**229**	**8**	**71**	**42**
450	11	--	4	6	2	2	7	2	--	--	--	11	--	10	1	--	--	11	--	--	--	--	2	9	--	<1	11	1	3	8	11	--	<1	11	--	<1	--
460	32	--	--	8	24	1	5	15	10	--	6	25	--	3	28	--	--	30	--	--	--	--	--	32	--	--	32	--	1	30	30	--	2	30	--	2	12
480	65	2	14	28	21	21	19	25	--	--	15	50	--	9	56	--	--	53	--	--	--	1	9	56	--	6	59	8	15	42	53	--	12	53	--	12	--
490	14	--	2	12	--	1	12	--	--	--	--	14	--	--	14	--	--	5	--	--	--	--	14	--	--	14	--	1	12	--	5	--	9	5	--	9	--
490.05	42	7	29	7	--	37	5	--	--	--	1	42	--	1	42	--	2	8	--	--	--	1	42	--	7	35	--	37	5	--	10	<1	33	10	<1	33	--
520	125	35	51	18	21	43	23	24	35	11	70	44	28	39	54	--	79	33	--	--	--	80	44	--	35	69	21	43	23	59	104	8	13	104	8	13	27
610	19	8	7	5	--	4	9	6	--	--	4	15	--	4	14	--	12	6	--	--	--	--	--	19	--	8	12	--	4	15	18	--	2	18	--	2	13
Ox Valley East Variation																																					
Ox Valley East Variation Total	**16**	**14**	**2**	**--**	**--**	**2**	**7**	**8**	**--**	**--**	**16**	**--**	**--**	**<1**	**<1**	**--**	**--**	**--**	**15**	**1**	**--**	**16**	**--**	**--**	**14**	**2**	**--**	**2**	**7**	**8**	**1**	**15**	**<1**	**1**	**15**	**1**	**2**
503	7	5	2	--	--	2	5	1	--	--	7	--	--	--	<1	--	--	--	7	<1	--	7	--	--	5	2	--	2	5	1	<1	7	--	<1	7	<1	<1
505	9	9	--	--	--	--	2	7	--	--	9	--	--	<1	<1	--	--	--	8	1	--	9	--	--	9	--	--	--	2	7	1	8	<1	1	8	<1	1

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Ox Valley East Variation Comparison																																					
Ox Valley East Variation Comparison Total	**15**	**14**	**1**	**--**	**--**	**5**	**9**	**1**	**--**	**--**	**13**	**2**	**--**	**--**	**1**	**--**	**--**	**--**	**1**	**12**	**--**	**9**	**5**	**1**	**10**	**5**	**<1**	**5**	**6**	**5**	**9**	**4**	**1**	**10**	**3**	**1**	**14**
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13
501.15	1	1	--	--	--	--	1	--	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	1	--	--	--	1	1	--	--	1	--	--	1
Ox Valley West Variation																																					
Ox Valley West Variation Total	**17**	**14**	**2**	**--**	**--**	**1**	**8**	**7**	**--**	**--**	**16**	**<1**	**--**	**<1**	**1**	**--**	**--**	**<1**	**15**	**1**	**--**	**16**	**<1**	**--**	**14**	**2**	**--**	**1**	**8**	**7**	**1**	**15**	**1**	**1**	**15**	**<1**	**2**
504	7	5	2	--	--	1	6	<1	--	--	7	<1	--	--	1	--	--	<1	6	<1	--	7	<1	--	5	2	--	1	6	<1	1	6	<1	1	6	0	<1
505	9	9	--	--	--	--	2	7	--	--	9	--	--	<1	<1	--	--	--	8	1	--	9	--	--	9	--	--	--	2	7	1	8	<1	1	8	<1	1
Ox Valley West Variation Comparison																																					
Ox Valley West Variation Comparison Total	**15**	**14**	**1**	**--**	**--**	**5**	**9**	**1**	**--**	**--**	**13**	**2**	**--**	**--**	**1**	**--**	**--**	**--**	**1**	**12**	**--**	**9**	**5**	**1**	**10**	**5**	**<1**	**5**	**6**	**5**	**9**	**4**	**1**	**10**	**3**	**1**	**14**
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13
501.15	1	1	--	--	--	--	1	--	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	1	--	--	--	1	1	--	--	1	--	--	1
Pinto Variation																																					
506	29	18	10	--	--	17	12	--	--	--	24	5	--	5	3	--	2	4	20	1	--	24	5	--	18	10	--	17	12	--	6	21	1	6	21	1	2
Pinto Variation Comparison																																					
Pinto Variation Comparison Total	**24**	**20**	**4**	**--**	**--**	**7**	**11**	**6**	**--**	**--**	**20**	**4**	**--**	**3**	**7**	**--**	**--**	**3**	**1**	**13**	**--**	**15**	**5**	**4**	**15**	**7**	**2**	**7**	**7**	**10**	**13**	**4**	**6**	**14**	**3**	**6**	**15**
500.05	10	7	3	--	--	2	3	5	--	--	8	2	--	3	5	--	--	3	--	1	--	6	<1	3	5	3	2	2	1	6	5	--	5	5	--	5	2
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Avon Connector																																					
495	8	--	1	3	4	8	--	--	--	--	--	8	--	--	8	--	--	3	--	--	--	--	8	--	--	4	4	8	--	--	3	--	5	3	--	5	--
Moapa Connector																																					
Moapa Connector	13	3	9	1	--	3	9	--	--	--	<1	13	<1	9	3	--	11	2	--	--	--	<1	9	3	3	7	3	3	6	3	12	1	--	12	1	--	2
570	10	3	6	1	--	3	6	--	--	--	<1	9	<1	9	<1	--	10	--	--	--	--	<1	9	--	3	7	--	3	6	--	8	1	--	8	1	--	<1
580	3	--	3	<1	--	--	3	--	--	--	--	3	--	--	3	--	1	2	--	--	--	--	--	3	--	--	3	--	--	3	3	--	--	3	--	--	1

[1] High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

[2] Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I, Table I-1**; **Appendix I, Figures I-2** and **I-3**).

[3] BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I, Table I-5**; **Appendix I, Figure I-7**).

[4] BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[5] USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[6] Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

[7] Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

[8] BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures** in **Appendix I**).

[9] Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-23**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to the standard routing engineering study for reference lines within a half-mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-16**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Table 3.12-16 Region III Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative III-A				
450	11	--	--	11
470	34	--	--	34
480	65	--	--	65
500	19	--	--	19
500.02	18	--	--	18
500.05	10	--	--	10
501.1	14	--	--	14
501.15	1	--	--	1
502.05	43	1	--	42
530	9	--	--	9
550	35	--	--	35
560	11	--	--	11
600	6	--	--	6

Table 3.12-16 Region III Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative III-B				
450	11	--	--	11
460	34	--	--	34
480	65	--	--	65
490	14	--	--	14
490.05	43	--	1	42
510	57	--	14	43
530	9	--	--	9
540	40	--	--	40
590	7	--	--	7
600	6	--	--	6
Alternative III-C				
450	11	--	--	11
460	32	--	--	32
480	65	--	--	65
490	14	--	--	14
490.05	43	--	1	42
520	124	9	--	115
610	19	--	--	19
Ox Valley East Variation				
503	7	--	--	7
505	9	--	--	9
Ox Valley East Variation Comparison				
501.1	14	--	--	14
501.15	1	--	--	1
Ox Valley West Variation				
504	7	--	--	7
505	9	--	--	9
Ox Valley West Variation Comparison				
501.1	14	--	--	14
501.15	1	--	--	1

Table 3.12-16 Region III Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Pinto Variation				
506	29	--	--	29
Pinto Variation Comparison				
500.05	10	--	--	10
501.1	14	--	--	14
Avon Connector				
495	8	--	--	8
Moapa Connector				
570	10	--	--	10
580	3	--	--	3

Segment numbers depicted in **Figure 2-23**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-17** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-A	450	Smelter Knolls Reservoir 0 Residences
III-A	470	4wd Rd, Old 6 And 50, US 6 0 Residences
III-A	480	4wd Rd, Beryl Milford Rd, Cat Canyon, Cat Canyon Reservoir, Chrystal Peak Rd, Cricket Mountains ATV Area, Cricket Mountains ATV Area, Jockey Rd, Long Lick Canyon, Lower Big Wash Reservoir, Mollies Nipple, Moscow Reservoir, Moscow Wash, Red Rock Number 1 Reservoir, S 24300 West St, SR 21, The Big Wash, Twelvemile Knoll 0 Residences
III-A	500	16000 Rd, 18200 Rd, 21600 Rd, Blue Knoll, E 18200 Rd, E 20600 Rd, Iron Springs Creek, Lund Hwy, Schoppmann Rd 0 Residences
III-A	500.02	10400 Rd, 1600 Rd, 8000 Rd, Bullion Canyon, Chloride Canyon, Sand Spring Canyon, Sand Spring Rd, Urie Hollow, W Antelope Rd 0 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-A	500.05	2600 Rd, 3200 Rd, 700 Rd, Bench Rd, E 300 Rd, Jefferson Hunt Monument, Old Spanish Historic Trail, SR 56, W Pinto Rd 13 Residences
III-A	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
III-A	501.15	Rancho Veyo Rd 0 Residences
III-A	502.05	Beaver Dam Slope ACEC, Beaver Dam Wash NCA, Biglow Ranch Rd, Burgess Wash, Grapevine Wash, Jackson Reservoir, Moody Wash Dixie National Forest Roadless, Mormon Mesa ACEC - Ely, Snow Spring Wash, Snow Spring Wash, Veyo Shoal Creek Rd 0 Residences
III-A	550	Carp Elgin Rd, Carpelgin Rd, Frontage Rd, I-15, Mormon Mesa ACEC, Muddy River Wildlife Study Area, Ramp, SR 12, Waterline Rd, Weiser Wash 0 Residences
III-A	560	Bitter Springs Backcountry Byway, Muddy Mountains SRMA, Old Spanish Historic Trail, RT 167, RT 169, SR 40 0 Residences
III-A	600	Old Spanish Historic Trail, Old Spanish Historic Trail 0 Residences
III-B	450	Smelter Knolls Reservoir 0 Residences
III-B	470	4wd Rd, Old 6 And 50, US 6 0 Residences
III-B	480	4wd Rd, Beryl Milford Rd, Cat Canyon, Cat Canyon Reservoir, Chrystal Peak Rd, Cricket Mountains ATV Area, Cricket Mountains ATV Area, Jockey Rd, Long Lick Canyon, Lower Big Wash Reservoir, Mollies Nipple, Moscow Reservoir, Moscow Wash, Red Rock Number 1 Reservoir, S 24300 West St, SR 21, The Big Wash, Twelvemile Knoll 0 Residences
III-B	490	13300 Rd, 9300 Rd, E 14900 Rd, E 18200 Rd, E 20600 Rd, E 23200 Rd, E 24000 Rd, Lund Hwy, N 10100 Rd, N 10900 Rd, N 12500 Rd 0 Residences
III-B	490.05	4wd Rd, 50 Rd, 5600 Rd, Beryl Milford Rd, Beryl Rd, Center St, Cow Trl, Deer Rd, Dick Palmer Wash, E 12000 Rd, Gold Springs Rd, Hamblin Valley Rd, Modena Reservoir, N 10000 Rd, N 10100 Rd, N 10200 Rd, N 10300 Rd, N 1600 Rd, N 3000 Rd, N 4000 Rd, N 7200 Rd, N 800 Rd, N 8000 Rd, N 8800 Rd, Sheep Spring Draw, SR 319, SR 56, Uvada Reservoir, W 6600 Rd, W Center St, Zane, Zane Rd 21 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-B	510	Abe Spring, Bally Knolls, Clover Mountains Wilderness, Jumbled Mountain, Lafes Reservoir, Mud Springs, Shoemake Spring, Summit Spring, The Ribbons, Topah Spring, Tule Spring 3 Residences
III-B	540	31 Residences, Barlow Ave, Casaby Ave, Dry Gulch Trl, Embry St, Henry Dr, Livingston Number Two Spring, Meadow Valley Wash Wildlife Study Area, Moapa Recreation Center Park, N Lawson Dr, Patriots Way, Pulsipher Ave, Rest Area, S Lawson Dr, S Sandy St, SR 168, SR 78, Vivian Pl 0 Residences
III-B	590	SR 40 0 Residences
III-B	600	Old Spanish Historic Trail, Old Spanish Historic Trail 0 Residences
III-C	450	Smelter Knolls Reservoir 0 Residences
III-C	460	North Clay Knoll Reservoir, Old Channel Sevier River, Rocky Knoll, S 18000 Rd, Soap Wash, Squire Ln, W 13000 Rd, W 2500 South St, West Clay Knoll Reservoir, West Marshall Tract Reservoir 0 Residences
III-C	480	4wd Rd, Beryl Milford Rd, Cat Canyon, Cat Canyon Reservoir, Chrystal Peak Rd, Cricket Mountains ATV Area, Cricket Mountains ATV Area, Jockey Rd, Long Lick Canyon, Lower Big Wash Reservoir, Mollies Nipple, Moscow Reservoir, Moscow Wash, Red Rock Number 1 Reservoir, S 24300 West St, SR 21, The Big Wash, Twelvemile Knoll 0 Residences
III-C	490	13300 Rd, 9300 Rd, E 14900 Rd, E 18200 Rd, E 20600 Rd, E 23200 Rd, E 24000 Rd, Lund Hwy, N 10100 Rd, N 10900 Rd, N 12500 Rd 0 Residences
III-C	490.05	4wd Rd, 50 Rd, 5600 Rd, Beryl Milford Rd, Beryl Rd, Center St, Cow Trl, Deer Rd, Dick Palmer Wash, E 12000 Rd, Gold Springs Rd, Hamblin Valley Rd, Modena Reservoir, N 10000 Rd, N 10100 Rd, N 10200 Rd, N 10300 Rd, N 1600 Rd, N 3000 Rd, N 4000 Rd, N 7200 Rd, N 800 Rd, N 8000 Rd, N 8800 Rd, Sheep Spring Draw, SR 319, SR 56, Uvada Reservoir, W 6600 Rd, W Center St, Zane, Zane Rd 21 Residences
III-C	520	Access Route, Antelope Canyon Rd, Buckboard Spring, Cedar Wash, Chief Mountain SRMA, Chokecherry Spring, Cobalt Canyon, Cobalt Canyon, Coyote Springs Valley ACEC, Delamar Mountains Wilderness, Delamar Valley, Desert National Wildlife Range, Fish and Wildlife #1, Fish and Wildlife #2, Fish and Wildlife #3, Gunsight Mountain Trl, Highway 93, Kane Springs ACEC, Kane Springs Wash, Keel Spring, Lien Draw, Miller Spring, Miser Gulch, Nelson Spring, Old Hwy 93, Old State Boundary Historical Marker, Perkins Number Two Reservoir, Powerline Reservoir, Pwr Line Maintenance Rd, Rainbow Canyon Backcountry Byway, Sawmill Rd, Silver State OHV Area, Silver State OHV Area, Silver State OHV Area Access Route, Silver State OHV Trail, Southeast Reservoirs, SR 168, SR 75, Unit 3/Sheep Range, US 93, Wamp Springs Trl 4 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-C	610	Apex Rd, I-15, Nellis Dunes SRMA, Old Spanish Historic Trail, Power Line Rd, Salt Lake Hwy, Service Rd, US 93 0 Residences
Ox Valley East Alternative Variation	503	Gum Hill, Gum Hill Dixie National Forest Roadless Ar, Meadow Canyon Rd, Mogotsu Dixie National Forest Roadless Are, Natl Forest Rd, Shinbone Creek, SR 18 0 Residences
Ox Valley East Alternative Variation	505	Bullrush Creek, Hardscrabble Hollow, Natl Forest Rd, Red Hardscrabble Trail, Valley Canyon 0 Residences
Ox Valley East Alternative Variation Comparison	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
Ox Valley East Alternative Variation Comparison	501.15	Rancho Veyo Rd 0 Residences
Ox Valley West Alternative Variation	504	Natl Forest Rd, S 1200th St 0 Residences
Ox Valley West Alternative Variation	505	Bullrush Creek, Hardscrabble Hollow, Natl Forest Rd, Red Hardscrabble Trail, Valley Canyon 0 Residences
Ox Valley West Alternative Variation Comparison	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
Ox Valley West Alternative Variation Comparison	501.15	Rancho Veyo Rd 0 Residences
Pinto Alternative Variation	506	Cove Hollow, Cove Mountain Dixie National Forest Rdle, Earl Canyon, Forest Rd, Grassy Flat Canyon, Kane Mountain Dixie National Forest Rdle, Kane Spring Draw, N Baker Rd, Natl Forest Rd, Newcastle Reservoir, Old State Hwy 144, Santa Clara River Fishing Access, South Fork Pinto Creek, SR 18, W Pine Valley Rd, W Pinto Rd, Wheat Grass Canyon 3 Residences
Pinto Alternative Variation Comparison	500.05	2600 Rd, 3200 Rd, 700 Rd, Bench Rd, E 300 Rd, Jefferson Hunt Monument, Old Spanish Historic Trail, SR 56, W Pinto Rd 13 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
Pinto Alternative Variation Comparison	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
Avon Alternative Connector	495	15200 Rd 0 Residences
Moapa Alternative Connector	570	Old Spanish Historic Trail, SR 40 0 Residences

Segment numbers depicted in **Figure 2-23**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above 4 feet in height would occur in the 250-foot-wide ROW unless otherwise specified in the PDTR. Only the 90-foot-wide “wire zone” and 250-foot-square structure construction area would be cleared in corridors classified as VRM Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 309 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-12**. The results are central components in **Table 3.12-17**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region III are portrayed by tables and maps of scenic quality classes (tables in **Appendix I** and **Figure I-2**), sensitivity levels (tables in **Appendix I** and **Figure I-4**), visual resource inventory classes (tables in **Appendix I** and **Figure I-7**), and visual resource management classes (tables in **Appendix I** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery, sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 62 KOPs selected, photographed, and analyzed in Region III. The KOP figures in **Appendix I**, portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation. Sixteen photographic simulations of the Project in Region III, for those KOP locations where agency management objectives would not be met, are shown in the tables in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures in **Appendix I**.

Alternative III-A (Applicant Proposed)

Alternative III-A would cross 276 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross U.S. 50, where the Project’s guyed structures would stand out

visually more (increased impact) than they would if seen with existing transmission line structures. At the eastern edge of the Cricket Mountains' crossing, the Project would join and parallel existing transmission lines southward to the Region III, Alternative III-A terminus just north of Las Vegas. The Project would cross and or parallel numerous highways (Utah State Highways 257, 21, 56, and 18, and I-15), recreational roads, and trails (**Table 3.12-17**), and in all cases it would parallel existing transmission lines (reduced impacts).

Recreationally important landscapes include the Sevier River plain and Cricket Mountains, where the Project's guyed and, substantially more dominant, self-supported structures are sky-lined (increased impact) in the landscape. All other recreationally important landscapes have existing transmission lines in the Projects' immediate viewshed. Of particular note is the Mountain Meadows National Historic Landmark Site viewshed where the Project would be placed on the far side of three existing transmission lines and two pipeline ROWs. This results in decreased impacts to viewers and landscape scenery. Landscape photography and project simulations are located in **Appendix I**, in the Fillmore, Cedar City, St. George and Southern Nevada FO sections.

Alternative III-A would be visible in the immediate foreground from 144 residences. Twenty-two percent of Alternative III-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eight percent of Alternative III-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). Two percent of Alternative III-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative III-A has decreased impacts as compared with Alternative III-B, Alternative III-C, and Alternative III-D. Twenty-five percent of the Alternative III-A reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative III-B (Agency Preferred)

Alternative III-B would cross 285 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). In areas with no existing transmission lines, it would cross U.S. 50 and closely parallel and would cross Utah State Highway 56, and would cross the Rainbow Backcountry Byway in two locations. The Project would cross several recreational roads and trails (**Table 3.12-17**) and recreationally important landscapes in the Sevier River Sand Dunes, Sevier River, Cricket Mountain, Red Pass, and landscapes east, north, west, and south of Caliente, including the Matthews Canyon Reservoir area, where there are no existing transmission lines (higher impacts). Landscape photography and project simulations are located in **Appendix I**, in the Fillmore, Cedar City, Ely, and Las Vegas FO sections.

Alternative III-B would be visible in the immediate foreground from 24 residences. Twenty-one percent of Alternative III-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Five percent of Alternative III-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). Less than 1 percent of Alternative III-B would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative III-B has increased impacts as compared with Alternative III-A. Alternative III-B is comparable to Alternative III-C. Twenty-eight percent of the Alternative III-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative III-C

Alternative III-C would cross 308 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). Adjacent to one or more existing transmission lines (reduced contrasts), it would cross U.S. 50, parallel Utah State Highway 257, would cross Utah State Highways 21 and parallel U.S. 93 in the Pahranagat and Coyote Spring Valleys. In areas with no existing transmission lines, it would closely parallel and would cross Utah State Highway 56, would cross U.S. 93 north and west of Caliente, and would cross the Silver State Trail in two locations. The Project would cross several recreational roads and trails (**Table 3.12-17**) and recreationally important landscapes east, north, and west of Caliente, where there are no existing transmission lines (higher impacts). All other recreationally important landscapes have existing transmission lines in the Projects' immediate viewshed. Landscape photography and project simulations are located in **Appendix I**, in the Fillmore, Cedar City, Ely, and Las Vegas FO sections.

Alternative III-C would be visible in the immediate foreground from 25 residences. Twenty-seven percent of Alternative III-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Fourteen percent of Alternative III-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). Three percent of Alternative III-C would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative III-C has increased impacts as compared with Alternative III-A. Alternative III-C is comparable to Alternative III-B. Fourteen percent of the Alternative III-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Avon Alternative Connector

The Avon Alternative Connector would cross 8 miles of landscape in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would closely parallel the Union Pacific Railroad. The Avon Alternative Connector would be visible in the immediate foreground from zero residences. None of the Avon Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**).

None of the Avon Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). All of the Avon Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Avon Alternative Connector would have minimal impacts over its reach, and would provide connection with Alternative II-A (decreased impacts). None of the Avon Connector reference line would be located within a utility corridor or utility window.

Moapa Alternative Connector

The Moapa Alternative Connector would cross 13 miles of landscape in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross I-15 in an area with several existing steel

lattice transmission lines in the view to the west (toward Alternative III-C) and no existing transmission lines to the east (toward Alternative III-A). It would be “sky-lined” (increased impact) in the immediate foreground of I-15. The Moapa Alternative Connector would cause high impacts to moderate sensitivity I-15 viewers in this immediate foreground (0 to 0.5-mile) viewing situation (**Table 3.12-17**). Moapa Alternative Connector would cross VRM Class III landscapes, where changes may attract attention, but should not dominate the view of the casual observer.

The Moapa Alternative Connector would have increased impacts as compared to Alternative III-A or Alternative III-C, in part due to the need for heavier self-supporting transmission line structures at the points-of-intersection with the alternatives. Fifteen percent of the Moapa Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

3.12.6.7 Region IV

Impact parameters relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and specific differences by alternative are presented below. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual Impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-18**. Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**.

The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

Residual Impacts

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-18**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, “walking the line”) are listed in the corresponding tables in **Appendix I**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to routing engineering study for, reference lines within a half-mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Table 3.12-18 Region IV Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative IV-A																																					
Alternative IV-A Total	**37**	**22**	**8**	**7**	**--**	**6**	**23**	**8**	**--**	**3**	**17**	**17**	**14**	**8**	**4**	**--**	**22**	**3**	**--**	**--**	**--**	**6**	**3**	**28**	**6**	**16**	**15**	**--**	**12**	**25**	**20**	**5**	**12**	**20**	**5**	**12**	**6**
620	6	2	2	2	--	2	4	--	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	2	4	--	2	4	6	--	<1	6	--	<1	5
630	4	4	--	--	--	1	3	--	--	--	4	1	4	<1	--	--	4	--	--	--	--	--	--	4	--	4	--	--	1	3	3	1	<1	3	1	<1	<1
660	8	8	<1	--	--	1	7	<1	--	2	6	1	6	--	<1	--	6	--	--	--	--	6	1	1	6	2	--	--	7	1	2	4	2	2	4	2	--
700	2	1	<1	--	--	1	1	--	--	1	--	<1	--	--	--	--	--	--	--	--	--	--	1	<1	--	1	<1	--	1	1	--	--	2	--	--	2	--
720	1	1	--	--	--	<1	1	--	--	<1	1	<1	1	--	--	--	1	--	--	--	--	--	<1	1	--	1	--	--	<1	1	1	--	1	1	--	1	--
740	4	4	--	--	--	<1	4	--	--	--	2	2	2	--	--	--	2	--	--	--	--	--	--	4	--	4	--	--	<1	4	2	--	2	2	--	2	--
790	12	2	6	5	--	1	3	8	--	<1	4	8	1	2	3	--	4	3	--	--	--	--	1	12	--	2	10	--	1	11	6	--	6	6	--	6	1
Alternative IV-B																																					
Alternative IV-B Total	**39**	**17**	**15**	**7**	**--**	**20**	**17**	**2**	**--**	**7**	**2**	**30**	**2**	**6**	**--**	**--**	**8**	**--**	**--**	**--**	**--**	**6**	**9**	**24**	**8**	**13**	**18**	**7**	**18**	**14**	**8**	**--**	**31**	**8**	**--**	**31**	**5**
620	6	2	2	2	--	2	4	--	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	2	4	--	2	4	6	--	<1	6	--	<1	5
640	4	4	--	--	--	--	4	--	--	--	2	2	2	<1	--	--	2	--	--	--	--	2	1	1	3	1	--	--	3	1	2	--	2	2	--	2	<1
670	4	2	2	--	--	3	1	--	--	3	<1	1	<1	--	--	--	<1	--	--	--	--	3	1	--	2	2	--	3	1		<1	--	4	<1	--	4	--
710	8	5	3	--	--	7	1	--	--	3	--	5	--	--	--	--	--	--	--	--	--	1	6	2	3	5	1	4	4	<1	--	--	8	--	--	8	--
750	<1	--	<1	--	--	<1	--	--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	<1	--	<1		--	--	<1	--	--	<1	--
760	8	4	4	--	--	4	3	--	--	1	--	7	--	--	--	--	--	--	--	--	--	--	1	7	--	4	4	--	4	3	--	--	8	--	--	8	--
800	2	--	2	--	--	2	--	--	--	--	--	2	--	--	--	--	--	--	--	--	--	--	--	2	--	--	2	--	2		--	--	2	--	--	2	--
820	7	--	2	5	--	1	4	2	--	--	--	7	--	--	--	--	--	--	--	--	--	--	--	7	--	--	7	--	1	6	--	--	7	--	--	7	--
Alternative IV-C																																					
Alternative IV-C Total	**44**	**14**	**17**	**8**	**5**	**15**	**26**	**3**	**--**	**8**	**2**	**34**	**2**	**6**	**--**	**--**	**8**	**--**	**--**	**--**	**--**	**6**	**10**	**28**	**8**	**10**	**26**	**7**	**13**	**24**	**8**	**--**	**36**	**8**	**--**	**36**	**5**
620	6	2	2	2	--	2	4	--	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	2	4	--	2	4	6	--	<1	6	--	<1	5
640	4	4	--	--	--	--	4	--	--	--	2	2	2	<1	--	--	2	--	--	--	--	2	1	1	3	1	--	--	3	1	2	--	2	2	--	2	<1
670	4	2	2	--	--	3	1	--	--	3	<1	1	<1	--	--	--	<1	--	--	--	--	3	1	--	2	2	--	3	1	--	<1	--	4	<1	--	4	--
710	8	5	3	--	--	7	1	--	--	3	--	5	--	--	--	--	--	--	--	--	--	1	6	2	3	5	1	4	4	<1	--	--	8	--	--	8	--
750	<1	--	<1	--	--	<1	--	--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	<1	--	<1	--	--	--	<1	--	--	<1	--
771	22	1	10	6	5	3	16	3	--	2	--	20	--	--	--	--	--	--	--	--	--	--	2	20	--	1	21	--	3	19	--	--	22	--	--	22	--
Marketplace Variation																																					
810	8	--	3	4	--	1	4	3	--	--	--	8	--	1	2	--	3	--	--	--	--	--	3	5	--	3	5	--	3	5	3	--	5	3	--	5	<1
Marketplace Variation Comparison																																					
820	7	--	2	5	--	1	4	2	--	--	--	7	--	--	--	--	--	--	--	--	--	--	--	7	--	--	7	--	1	6	--	--	7	--	--	7	--

Table 3.12-18 Region IV Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Sunrise Mountain Connector																																				
650	3	3	--	--	--	1	2	--	--	--	3	--	3	--	--	--	3	--	--	--	--	2	--	1	2	1	--	1	1	<1	2	1	--	2	1	--	--
Lake Las Vegas Connector																																				
680	4	3	1	--	--	4	--	--	--	2	--	1	--	--	--	--	--	--	--	--	--	2	1	--	3	1	--	4	--	--	--	--	4	--	--	4	--
Three Kids Mine Connector																																				
690	5	5	1	--	--	1	5	--	--	1	1	4	1	--	--	--	1	--	--	--	--	2	4	--	5	1	--	1	5	--	1	--	5	1	--	5	--
River Mountain Connector																																				
730	7	3	4	--	--	<1	5	2	--	<1	2	5	2	--	--	--	2	1	--	--	--	2	3	2	3	2	2	--	4	3	2	--	5	2	--	5	--
Railroad Pass Connector																																				
780	3	1	2	--	--	3	--	--	--	--	--	3	--	--	--	--	--	--	--	--	--	--	--	3	--	1	2	--	3	--	--	--	3	--	--	3	--

1 High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

2 Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I, Table I-1**; **Appendix I, Figures I-2** and **I-3**).

3 BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I, Table I-5**; **Appendix I, Figure I-7**).

4 BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

5 USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

6 Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

7 Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

8 BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures** in **Appendix I**).

9 Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-24**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-19**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Table 3.12-19 Region IV Scenic Quality Class Changes by Alternative and Segment

Alternative	Total Miles	Class A to B	Class B to C	No Change
Alternative IV-A				
620	6	--	--	6
630	4	--	--	4
660	8	--	--	8
700	2	--	--	2
720	1	--	--	1
740	4	--	--	4
790	12	--	--	12
Alternative IV-B				
620	6	--	--	6
640	4	--	--	4
670	4	--	--	4
710	8	--	--	8
750	<1	--	--	<1
760	8	--	---	8
800	2	--	--	2
820	7	--	--	7
Alternative IV-C				
620	6	--	--	6
640	4	--	--	4
670	4	--	--	4
710	8	--	--	8
750	<1	--	--	<1
771	22	--	--	22
Marketplace Variation				
810	8	--	--	8
Marketplace Variation Comparison				
820	7	--	--	7

Table 3.12-19 Region IV Scenic Quality Class Changes by Alternative and Segment

Alternative	Total Miles	Class A to B	Class B to C	No Change
Sunrise Mountain Connector				
650	3	--	--	3
Lake Las Vegas Connector				
680	4	--	--	4
Three Kids Mine Connector				
690	5	--	--	5
River Mountain Connector				
730	7	--	--	7
Railroad Pass Connector				
780	3	--	--	3

Segment numbers depicted in **Figure 2-24**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-20** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-20 Region IV Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
IV-A	620	Apex Rd, Rainbow Gardens ACEC, Sunrise Mountain SRMA 0 Residences
IV-A	630	Gypsum Rd, Gypsum Spring, SR 147, Sunrise Mountain Instant Study Area (ISA) 0 Residences
IV-A	660	4wd Rd, Argonaunt, Armillaria St, Bee Balm Ct, Big Bird Ct, Black Lava Ct, Boletus Dr, Broken Hills Dr, Brown Hill Ct, Calico Ridge Dr, Camelia Dr, Candy Tuft Dr, Chanterelle Dr, Charlene Ct, Chrysanthemum Rd, Clark County Wetlands Park, Companion Way, Cutter St, Feather Haven Ct, Feather Point Ct, Geranium Dr, Golda Way, Hyperion Dr, Iolite Ct, Luca Ln, Majesty Ct, Malachite Ct, Marigold Ct, Morning Melody Ct, Norellat Rd, Old Spanish Historic Trail, Pabco Rd, Primrose Ct, Primrose Ln, Pyrite Ave, Rainbow Gardens, Rhyolite Ter, Roy Way, Rubellite St, Skysail Dr, SR 146, Verdite Ave, Weatherboard St, Whistle Ct, White Hill Cir 550 Residences
IV-A	700	4wd Rd, Essex Ave, Foothill Dr, Ithaca Ave 0 Residences
IV-A	740	Las Vegas Valley SRMA, River Mountains ACEC 8 Residences
IV-A	790	4wd Rd, Black Hill, Car Country Blvd, E Horizon Ridge Pky, Nelson/ Eldorado SRMA, Sloan Canyon NCA, Trail, US 93 0 Residences
IV-B	620	Apex Rd, Rainbow Gardens ACEC, Sunrise Mountain SRMA 0 Residences

Table 3.12-20 Region IV Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
IV-B	640	Gypsum Rd, Pabco Rd 0 Residences
IV-B	670	Las Vegas Wash, Lava Butte Wash, SR 146, SR 167 0 Residences
IV-B	710	Boulder Beach Cmpgrnd, Boulder Canyon Project Federal Reservation, Lake Mead National Recreation Area, Lake Mead Rd, Ramp, SR 166 16 Residences
IV-B	750	Las Vegas Bay Rd, Ramp, SR 166 0 Residences
IV-B	760	Aaron Way, Black Canyon Cove Rd, Bootleg Canyon, Bootleg Canyon, Bootleg Wash, Calumet Ln, Cascata Golf Course, Connecting Rd, Genni Pl, Golf Course, Greenbriar Pl, Hemenway Cove, Hidden Cove, Isabel Ln, Island Cove, Jani Pl, Judi Pl, Kati Pl, Katzenbach Dr, Kendall Ln, Keys Dr, Kingman Cove, Lake Erie Ln, Lake Havasu Ln, Lake Huron Ln, Lake Merritt Ln, Lake Michigan Ln, Lake Mountain Dr, Lake Ontario Ln, Lake Superior Ln, Lake Tahoe Ln, Lake Terrace Dr, Lake Winnebago Ln, Lakes Dr, Lido Dr, Marina Cove, Marina Dr, Mount Antero Way, Mount Bear Way, Mount Blackburn Ln, Mount Bona Way, Mount Elbert Way, Mt Hunter Way, Mount Tamalpais Way, Mount Williamson Way, Mt Ranier Way, Old Spanish Historic Trail, Pacifica Way, Patti Pl, Robinson Ln, Robinson Way, Swallow Cove, Tara Ct, US 93, Veterans Dr, Veterans Memorial Dr, Ville Dr, Woodacre Dr, Woodcrest Dr, Yates Ln, Yucca St 516 Residences
IV-B	820	Lake Mead National Recreation Area 0 Residences
IV-C	620	Apex Rd, Rainbow Gardens ACEC, Sunrise Mountain SRMA 0 Residences
IV-C	640	Gypsum Rd, Pabco Rd 0 Residences
IV-C	670	Las Vegas Wash, Lava Butte Wash, SR 146, SR 167 0 Residences
IV-C	710	Boulder Beach Campground, Boulder Canyon Project Federal Reservation, Lake Mead National Recreation Area, Lake Mead Rd, Ramp, SR 166 16 Residences
IV-C	750	Las Vegas Bay Rd, Ramp, SR 166 0 Residences
IV-C	771	Adams Blvd, Alaska Ave, Bronco Rd, Chestnut Ln, Del Prado Dr, El Canto Way, Lake Mead National Recreation Area, Olmo Way, Otono Dr, Ramp, Rawhide Rd, Rest Area, Smoke Ranch Rd, Sorrel Rd, SR 166, US 93, US 95 94 Residences
Marketplace Alternative Variation	820	Lake Mead National Recreation Area 0 Residences
Lake Las Vegas Alternative Connector	680	Lake Las Vegas Pky, Lake Mead NRA, Old Spanish Historic Trail, Pyrenees Ct, Ramp, Rest Area, SR 146 0 Residences
River Mountain Alternative Connector	730	River Mountains 0 Residences

Segment numbers depicted in **Figure 2-24**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above four-feet in height would occur in the 250-foot corridor unless otherwise specified in the PDTR. Only the 90-foot-wide "wire zone" and 250-foot-square structure construction area would be cleared in corridors classified as VRM

Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 309 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-12**. The results are central components in **Table 3.12-20**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region IV are portrayed by tables and maps of scenic quality classes (tables in **Appendix I** and **Figure I-2**), sensitivity levels (tables in **Appendix I** and **Figure I-4**), visual resource inventory classes (tables in **Appendix I** and **Figure I-7**), and visual resource management classes (tables in **Appendix I** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery, sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 15 KOPs selected, photographed, and analyzed in Region IV. The KOP figures in **Appendix I** portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation, Three photographic simulations of the Project in Region IV, for those KOP locations where agency management objectives would not be met, are shown in the tables in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures in **Appendix I**.

Alternative IV-A (Agency Preferred and Applicant Proposed)

Alternative IV-A would cross 37 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross the Sunrise Mountain ISA, a VRM Class I landscape. It would cross the Old Spanish Trail, Lake Mead Boulevard (the accessway to Lake Mead NRA), I-15, and U.S. 93-95, in addition to several recreational roads and trails (**Table 3.12-20**), and would be “sky-lined” (increased impact) in those areas. Recreationally important landscapes include the Clark County Wetlands Park, Sunrise Mountain ISA, Rainbow Gardens ACEC, and the Las Vegas Wash area, where the Project’s guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen in the same viewshed with existing transmission line structures. The majority of Alternative IV-A would parallel existing transmission lines in valley situations, but sometimes is distanced enough to be on the opposite side of ridgelines. Landscape photography and project simulations are located in **Appendix I**, in the Lake Mead NRA and Las Vegas FO sections.

Alternative IV-A would be visible in the immediate foreground from 558 residences. Sixteen percent of Alternative IV-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixteen percent of Alternative IV-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). Alternative IV-A would cross 1.1 miles of the Sunrise Mountain ISA VRM Class I landscape where changes may be ecological or from very limited management activities. However, in this area, it would closely parallel four existing transmission lines. Fourteen percent of Alternative IV-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads and trails, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative IV-A has decreased impacts compared with Alternative IV-B and Alternative IV-C, except where it would cross the Rainbow Gardens ACEC area which is undeveloped and would cause localized increased impacts over Alternative IV-B and Alternative IV-C. Eighty-six percent of the Alternative IV-A reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative IV-B

Alternative IV-B would cross 39 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross the Old Spanish Trail, Lakeshore Road through Lake Mead NRA, I-15, and U.S. 93-95, in addition to several recreational roads and trails (**Table 3.12-20**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Lake Mead NRA, the Las Vegas Bay boat launch area, Lake Mead Marina, and Boulder Harbor, where the Project's guyed and, substantially more dominant, self-supported structures would be seen with existing transmission line structures. The majority of Alternative IV-B would parallel existing transmission lines in valley situations, but sometimes is distanced enough to be on the opposite side of ridgelines. Landscape photography and project simulations are located in **Appendix I**, in the Lake Mead NRA and Las Vegas FO sections.

Alternative IV-B would be visible in the immediate foreground from 532 residences. Fifteen percent of Alternative IV-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-one percent of Alternative IV-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of Alternative IV-B would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads and trails, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative IV-B has increased impacts compared with Alternative IV-A, and has comparable impacts to Alternative IV-C. Thirteen percent of the Alternative IV-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative IV-C

Alternative IV-C would cross 44 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross the Old Spanish Trail, Lakeshore Road through Lake Mead NRA, I-15, and U.S. 93-95, in addition to several recreational roads and trails (**Table 3.12-20**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Lake Mead NRA, the Las Vegas Bay boat launch area, Lake Mead Marina, Boulder Harbor, and the south entry to Lake Mead NRA, where the Project's guyed and, substantially more dominant, self-supported structures would be seen with existing transmission line structures. The majority of Alternative IV-C would parallel existing transmission lines in valley situations, but sometimes is distanced enough to be on the opposite side of ridgelines. Landscape photography and project simulations are located in **Appendix I**, in the Lake Mead NRA and Las Vegas FO sections.

Alternative IV-C would be visible in the immediate foreground from 110 residences. Thirteen percent of Alternative IV-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eighteen percent of Alternative IV-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of Alternative IV-C would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads and trails, where the Project is

"sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative IV-C has increased impacts compared with Alternative IV-A, and has comparable impacts to Alternative IV-B. Eleven percent of the Alternative IV-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Sunrise Mountain Alternative Connector

The Sunrise Mountain Alternative Connector would cross 3 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross Lake Mead Boulevard in an area with an existing transmission line and would cross four additional transmission lines near its terminus with Alternative IV-A. The Sunrise Mountain Alternative Connector would cross the Sunrise Mountain ISA, a VRM Class I landscape. The Sunrise Mountain Alternative Connector would be visible in the immediate foreground from zero residences. Sixty-seven percent of the Sunrise Mountain Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixty-seven percent of The Sunrise Mountain Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). Thirty-four percent of the Sunrise Mountain Alternative Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3).

Due to its location in developed landscape, the Sunrise Mountain Alternative Connector has comparable impacts to the Lake Las Vegas Alternative Connector and River Mountain Alternative Connector. It has decreased impacts over the Railroad Pass Alternative Connector. The Sunrise Mountain Alternative Connector has increased impacts over the Three Kids Mine Alternative Connector. None of the Sunrise Mountain Connector reference line would be located within a utility corridor or utility window.

Lake Las Vegas Alternative Connector

The Lake Las Vegas Alternative Connector would cross 4 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would parallel Lake Mead Drive in an area with an existing transmission line. The Lake Las Vegas Alternative Connector would be visible in the immediate foreground from zero residences. Fifty percent of the Lake Las Vegas Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Seventy-five percent of The Lake Las Vegas Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Lake Las Vegas Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in developed landscape, the Lake Las Vegas Alternative Connector has comparable impacts to the Sunrise Mine Alternative Connector and River Mountain Alternative Connector. It has decreased impacts over the Railroad Pass Alternative Connector. The Lake Las Vegas Alternative Connector has increased impacts over the Three Kids Mine Alternative Connector. None of the Lake Las Vegas Connector reference line would be located within a utility corridor or utility window.

Three Kids Mine Alternative Connector

The Three Kids Mine Alternative Connector would cross 5 miles of undeveloped landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would be visible in the immediate foreground from zero residences. Forty percent of the Three Kids Mine Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or

moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). One hundred percent of The Three Kids Mine Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Three Kids Mine Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in undeveloped landscape, the Three Kids Mine Alternative Connector has increased impacts over the Sunrise Mine Alternative Connector, Railroad Pass Alternative Connector, and River Mountain Alternative Connector. None of the Three Kids Mine Connector reference line would be located within a utility corridor or utility window.

River Mountain Alternative Connector

The River Mountain Alternative Connector would cross 7 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would parallel an existing transmission line. The River Mountain Alternative Connector would be visible in the immediate foreground from zero residences. Twenty-nine percent of the River Mountain Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Forty-three percent of the River Mountain Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the River Mountain Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in developed landscape, the River Mountain Alternative Connector has comparable impacts with the Sunrise Mine Alternative Connector, Railroad Pass Alternative Connector, and River Mountain Alternative Connector. It has increased impacts over the Three Kids Mine Alternative Connector. None of the River Mountain Connector reference line would be located within a utility corridor or utility window.

Railroad Pass Alternative Connector

The Railroad Pass Alternative Connector would cross 3 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would parallel an existing transmission line. The Railroad Pass Alternative Connector would be visible in the immediate foreground from zero residences. None of the Railroad Pass Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of The Railroad Pass Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Railroad Pass Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in developed landscape, the Railroad Pass Alternative Connector has comparable impacts with the Sunrise Mine Alternative Connector, Railroad Pass Alternative Connector, and River Mountain Alternative Connector. It has decreased impacts over the Three Kids Mine Alternative Connector. None of the Railroad Pass Connector reference line would be located within a utility corridor or utility window.

Marketplace Variation

The Marketplace Variation would cross 8 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross U.S. 95 and would be “sky-lined” (increased impact)

in that area. The Marketplace Variation would be visible in the immediate foreground from zero residences. None of the Marketplace Variation would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of The Marketplace Variation would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Marketplace Variation would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in undeveloped landscape, the Marketplace Variation has increased impacts over Alternative IV-B (which would parallel multiple transmission lines). Less than 1 percent of the Marketplace Variation reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

3.12.6.8 Residual Impacts

All of the action alternatives would result in residual impacts to people and scenery. Topographic modifications on moderate to steep slopes, vegetation management, and sky-lined structures situated in the immediate foreground would impact sensitive viewers and Class A and Class B scenery.

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts (what would remain after mitigation) for landscape scenery, high viewer sensitivity and moderate viewer sensitivity by alternative and segment are listed in regional impacts sections. Residual impacts to landscape scenery, high viewer sensitivity and moderate viewer sensitivity by region, alternative, segment, and mileposts (as if, “walking the line”) are listed in **Appendix I**, **Tables I-11** through **I-14**, respectively.

3.12.6.9 Impacts from the No Action Alternative

Current management across the study area would be maintained under the No Action alternative. Under this alternative, there would be no project construction or operation to impact visual resources.

3.12.6.10 Irreversible and Irretrievable Commitment of Resources

Irretrievable impacts to visual resources are anticipated where pinyon-pine, ponderosa, spruce-fir, cottonwood and aspen are involved in ROW management, since trees would not be replanted, or would be replanted and result in age disparities, and the effects would be noticeable to the casual observer.

Vegetation management effects in these ROWs would be irretrievable in the long term (50 to 100 years), or until wildfires or large scale vegetation management actions clear vegetation in patterns informed by the topography. The impacts are noted in the tables in the impacts sections for Regions I, II, and III. No irreversible impacts would occur assuming long-term time frames and complete restoration after decommissioning.

3.12.6.11 Relationship Between Local Short-term Uses and Long-term Productivity

Short-term vegetation management may impair long-term visual resources.

TransWest Express Transmission Project

Draft

Environmental Impact Statement

(Volume III)

BLM

Wyoming State Office

June 2013

Western AREA POWER ADMINISTRATION

Mission Statement

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

Mission Statement

Western is a Federal agency under the Department of Energy that markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states. Western's mission: Market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services.

BLM/WY/PL-13/021+5101

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3.13 Recreation Resources

This section provides baseline information regarding outdoor recreation uses on public and private lands that could be affected by the Project in Wyoming, Colorado, Utah, and Nevada. Included within this section is a description of the existing recreational opportunities and activities, recreation use estimates for BLM and USFS lands in the analysis area, a description of the recreation sites that occur in each region of the analysis area, and an overview of the plans and regulations of federal, state, and local land management agencies that provide recreation opportunities in the analysis area. Direct effects to other resources that indirectly affect recreation are discussed in those respective sections, including Section 3.7, Wildlife; Section 3.5, Vegetation; Section 3.12, Visual Resources; and Section 3.16, Transportation and Access.

3.13.1 Regulatory Background

A variety of federal, state, and local land management agencies serve as recreation providers in the analysis area, including USFS, BLM, USFWS, Bureau of Reclamation, NPS, various state agencies that regulate recreation uses on state lands, and local and county governments. These entities guide recreation activities on public lands with management plans developed under their guiding authority. The following sections summarize the management plans for federal, state, and county/municipal agencies that manage recreation within the analysis area.

3.13.1.1 Federal Plans, Policies, and Regulations

BLM

All BLM-administered public lands in Wyoming, Colorado, Utah, and Nevada are managed in accordance with the approved RMP or MFP for each BLM FO. Each RMP/MFP provides goals, objectives, and management actions to guide recreational uses of BLM-managed land resources within the FO. BLM RMPs that are pertinent to the project are listed in **Table 1-3**. In addition, the BLM prepares a variety of planning documents related to its recreation and visitor services program, including interpretive plans and travel management plans.

USFS

The USFS conducts planning activities and administers NFS lands in accordance with provisions of the NFMA of 1976, NEPA, and other applicable legislation and regulations. A LRMP is required for each forest and provides direction for all resource management programs, including recreation uses. The USFS LRMP and EIS documents pertinent to the project are listed in **Table 1-4**. Other USFS planning documents that identify recreational opportunities and facilities, and provide guidance for recreation uses within the analysis area are listed in **Table 3.13-1**.

USFWS/NPS/Bureau of Reclamation

Although most public lands within the analysis area that are managed by a federal agency are managed by the BLM or USFS, there are areas managed by the USFWS, NPS, and Bureau of Reclamation in Colorado, Nevada, and Utah. Typically the agency has a management plan that includes goals, objectives, policies, and/or regulations pertaining to recreation within their management area or agreements with local agencies for management. A list of these plans is included in **Table 3.13-1**.

3.13.1.2 State Plans, Policies, and Regulations

State lands within the analysis area include state parks, wildlife management areas (WMAs), and other special management areas that include recreational uses of the land resources. Planning documents that identify recreational opportunities and facilities, and provide guidance for recreation uses in various state management areas within the analysis area are listed in **Table 3.13-1**.

Table 3.13-1 Federal and State Recreation Planning Documents for Managing Recreation

State	Planning Document	Agency
Wyoming	2004 Wyoming Statewide Trails Plan	Wyoming Department of State Parks & Cultural Resources, Division of State Parks & Historic Sites – Trails Program
	Wyoming Statewide Comprehensive Outdoor Recreation Plan 2009-2013	Wyoming Department of State Parks and Cultural Resources, Division of State Parks, Historic Sites and Trails
	Continental Divide National Scenic Trail Comprehensive Plan 2009	USFS
Colorado	Colorado Statewide Comprehensive Outdoor Recreation Plan 2008-2012	Colorado Parks and Wildlife
	Colorado Division of Wildlife: Chapter 9 – Division Properties; Regulations Applicable To All Division Properties 2012	
	Dinosaur National Monument General Management Plan 1986 River Management Plan 1979	NPS
Utah	Utah Statewide Comprehensive Outdoor Recreation Plan 2009	Utah State Parks
	Starvation Reservoir Resource Management Plan 1999	Bureau of Reclamation
Nevada	Nevada Statewide Comprehensive Outdoor Recreation Plan 2010	Nevada State Parks
	Clark County Wetland Park Master Plan	Clark County/Bureau of Reclamation
	Desert National Wildlife Refuge Complex Final Comprehensive Conservation Plan and EIS 2009	USFWS
	Lake Mead National Recreation Area General Management Plan 1986 Land Protection Plan 1987 Lake Management Plan 2003	NPS

State-owned lands within the analysis area that are not part of designated management areas, such as state parks or wildlife management areas, include lands held in trust and managed by a designated state agency (State Land Board, Office of State Lands) to produce income to support public schools and other state institutions.

Statewide Comprehensive Outdoor Recreation Plans (SCORPs) have been prepared by the states of Wyoming, Colorado, Utah, and Nevada. A SCORP provides statewide policy direction for recreation; identifies statewide outdoor recreation issues; and provides an implementation program that identifies the state's strategies, priorities, and actions for recreation, including the allocation of federal grants to recreation programs and facilities. Each SCORP is a collaborative effort developed with the assistance and support of a diverse array of recreation stakeholders representing local, state, and federal agencies; non-profit groups; outdoor industry groups; and other organizations directly linked to outdoor recreation.

3.13.1.3 County Plans, Policies, and Regulations

General Plans or Comprehensive Plans for a county (including master plans or land use plans) generally consist of a map or maps showing existing and planned land uses, as well as descriptive text identifying objectives, goals, policies, and standards or actions used to implement the plan. Each comprehensive plan includes a plan element for parks or open space, and recreation. This plan element identifies an overall vision or direction for recreation as it relates to community needs, and provides direction for specific facilities and opportunities. A tabulation of county planning documents is contained in Section 3.14, Land Use.

3.13.2 Data Sources

The recreational resources in the analysis area were identified from a variety of public sources and from field reconnaissance conducted during January through March of 2011. Recreation information for public lands administered by the BLM and the USFS were identified from a review of available data in affected BLM Field Office RMPs and websites, and USFS National Forest LRMPs and websites. BLM recreation specialists or other field office personnel were contacted to acquire available BLM data in a digital or hard-copy format. In addition, designated parks and open spaces on county and municipal lands were identified from the recreation and open space elements of Comprehensive Plans, General Plans, and other land use management plans adopted by counties and incorporated cities within the analysis area. Scenic Byway information was obtained from data provided by the National and State Scenic Byway programs website.

3.13.3 Analysis Area

The alternative routes and ancillary facilities are located within 23 counties in four states and include federal lands managed by the BLM, USFS, various state agencies, municipal lands, and private lands. The majority of recreation resources within the analysis area occur on federal lands managed by the BLM and USFS.

The analysis area for characterizing recreation resources comprises all public general recreation areas and special recreation management areas for which any portion of the area is contained within a 2-mile transmission line corridor centered on the 250-foot-wide transmission line ROW or within additional project areas (terminal, ground electrode siting areas, etc.). The 2-mile transmission line corridor was used to analyze impacts to recreation resources because it would include all access roads, substations, and other permanent or temporary facilities and because it would largely encompass all potential intrusions experienced by the public from the 250-foot-wide transmission line ROW. Context for the impact to recreational areas and uses is obtained by considering the impact to the portion within the 2-mile transmission line corridor against the total special management area or area available for general recreation. In some cases, visual and noise effects to the recreation setting may require a wider analysis area for the full characterization and impact analysis of those resources. Analysis areas for related resources are defined in the appropriate sections (Section 3.12, Visual Resources; Section 3.18.5, Noise) and are incorporated by reference in this section as applicable.

3.13.4 Baseline Description

Outdoor recreation opportunities on public lands in Wyoming, Colorado, Utah, and Nevada are a key factor that has attracted many people to the western U.S. The proximity of USFS, BLM, and other public lands to urbanized areas and rural communities is important to the quality of life for many residents and also is an important lifestyle factor in the increasing populations of many western communities. In addition, recreational use on public lands helps support the economies of western communities and states. The demand for outdoor recreation in the West has risen substantially, by 65 percent in the last 30 years (BLM undated). Recreation in the analysis area includes a broad range of developed and dispersed recreation opportunities on public and private lands.

3.13.4.1 Recreation Use Estimates and Trends

BLM

The BLM provides annual public lands statistics (BLM 2011a) that include an overview of recreational use and opportunities on public lands. BLM offices are responsible for collecting and maintaining various data related to the recreation program. The field-level data are aggregated in the BLM's Recreation Management Information System (RMIS) database. **Table 3.13-2** summarizes estimated visitor use of BLM lands by state from 2000 to 2010.

Table 3.13-2 Estimated Recreation Use on BLM Lands by State, 2000 – 2010

Administrative State	Developed Recreation Sites		Dispersed Areas		Recreation Lease Sites		Recreation Partnership Sites		Total	
	Visits (1,000)[1]	Visitor Days (1,000)[2]	Visits (1,000)[1]	Visitor Days (1,000)[2]	Visits (1,000)[1]	Visitor Days (1,000)[2]	Visits (1,000)[1]	Visitor Days (1,000)[2]	Visits (1,000)[1]	Visitor Days (1,000)[2]
Colorado										
2000	2,356	1,122	2,400	2,084	N/A	N/A	N/A	N/A	4,576	3,206
2010	2,497	1,402	3,265	4,610	0	0	686	127	6,448	6,139
% change	6.0%	25.0%	36.0%	121.2%	--	--	--	--	40.9%	91.5%
Nevada										
2000	1,822	695	3,223	3,415	N/A	N/A	N/A	N/A	5,045	4,110
2010	2,311	1,606	3,639	2,960	0	0	21	5	5,971	4,571
% change	26.8%	131.1%	12.9%	-13.3%	--	--	--	--	18.4%	11.2%
Utah										
2000	3,602	3,062	2,567	4,750	N/A	N/A	N/A	N/A	6,169	7,812
2010	2,888	1,987	2,998	3,190	21	8	183	178	6,090	5,363
% change	-19.8%	-35.1%	16.8%	-32.8%	--	--	--	--	-1.3%	-31.3%
Wyoming										
2000	1,676	423	1,979	1,862	N/A	N/A	N/A	N/A	3,655	2,285
2010	1,148	729	1,261	765	0	0	43	16	2,452	1,510
% change	-31.5%	72.3%	-36.3%	-58.9%	--	--	--	--	-32.9%	-33.9%

[1] A visit is the entry of any person for recreational purposes onto lands and related waters administered by the BLM, regardless of duration.
[2] One visitor day represents an aggregate of 12 visitor hours at a site or area.

Sources: BLM 2001b, BLM 2011a.

Visits to both developed recreation sites and dispersed recreation areas on BLM-managed lands and waters have increased in Colorado and Nevada, while visits to BLM-developed recreation sites and dispersed recreation areas in Wyoming have decreased. Utah has experienced an increase in the use of BLM dispersed recreation areas, but a sharp decrease in use of developed recreation sites. Recreation lease sites and recreation partnership sites accounted for nearly a total of 1 million additional visits to BLM lands in all four states in 2010. Recreation visits on BLM lands in all four states increased by 7 percent between 2000 and 2010 (BLM 2011a). This has led to greater and more diverse forms of recreation use, as well as an increase in user conflicts and public concern over the most appropriate uses and management of the public lands. For all public lands, public demand for outdoor recreation, driven in part by a growing U.S. population and rising international visitation, continues to intensify; however, population increases in western states are not reflected in increasing visitation to BLM-managed lands in Utah and Wyoming. Other factors that may contribute to differing trends in recreation use estimates between the four states could include relative levels of disposable incomes, relative age of the population, or other demographic differences.

USFS

The National Visitor Use Monitoring (NVUM) program provides estimates of the volume and characteristics of recreation visitation to NFS lands to help the USFS manage its recreation resources in a way that meets the needs of visitors while maintaining the quality of the natural resource base. The NVUM program conducts more than 100,000 visitor surveys on NFS lands every 5 years, with 20 percent of the national forests conducting surveys each year. This nationwide visitor use survey provides statistically sound estimates of visitation to each national forest and to each site type. The visitation data for the Ashley, Dixie, Fishlake, Manti-La Sal, and Uinta national forests, shown in **Table 3.13-3**, are from NVUM data collection completed from FY2002 through FY2011. Each forest gets sampled once every 5 years, so in a given year several forests are engaged in NVUM field data collection. Those forests that completed their NVUM work in 2009 were updating visitation estimates from approximately 5 years earlier. The NVUM data does not provide trend measures, but reports only the most current visitation patterns and activities on NFS lands. Data for 2002 and 2006 for some forests shown in **Table 3.13-3** were collected from forest plans and may not represent the same sampling methods.

Table 3.13-3 Estimated Recreation Use on National Forests Crossed by Analysis Area, 2002 to 2011

National Forest	Visits						
	2002	2006	2007	2008	2009	2010	2011
Ashley	1,338,428	N/A	960,000	N/A	N/A	N/A	N/A
Dixie	N/A	646,000	N/A	N/A	733,000	N/A	N/A
Fishlake	447,270	487,000	N/A	531,000	N/A	N/A	N/A
Manti-La Sal	804,301	672,000	N/A	N/A	N/A	N/A	352,000
Uinta*	2,840,000	N/A	2,934,000	N/A	N/A	N/A	N/A

N/A = not available.

* Reported visitation is for just the Uinta National Forest portion of the Uinta-Wasatch-Cache National Forest. Only recreation resources within the Uinta National Forest, as identified in the Uinta National Forest LRMP, are within the analysis area. Therefore, all subsequent references to the Uinta-Wasatch-Cache National Forest will be only to the Uinta National Forest, which may differ from other resource sections.

Sources: USFS 2002 to 2011.

Based on the NVUM data, Uinta National Forest received the most visitation with about 3 million visits per year, with increased visitation between 2002 and 2007. The Ashley National Forest received between 900,000 and 1.4 million visits; current data show a decrease in visitation between 2002 and 2007. The Dixie and Manti-La Sal national forests generally received between 500,000 and 800,000 visits per year; current data show an increase in visitation to the Dixie National Forest, while visitation on the Manti-La Sal National Forest dropped each reporting year, with a drop to below 400,000 in 2011 (USFS 2002 to 2011). The Fishlake National Forest received the least visitation, with an average visitation of less than 500,000.

3.13.4.2 Recreation Opportunities

Recreation opportunities exist on all public lands within the analysis area. Recreation opportunities may be dispersed or developed:

- Dispersed recreation opportunities include unstructured activities and typically occur in a more primitive setting. Dispersed, unstructured activities typify the recreational uses occurring on public (federal and state) lands throughout the majority of the analysis area. Dispersed recreation in the analysis area includes motorized and non-motorized activities such as undeveloped camping, fishing, hunting, hiking, horseback riding, rock and ice climbing, mountain biking, snowmobiling, caving, off-highway vehicle (OHV) trail riding or open area

use, and driving for pleasure. Dispersed recreation activities by Project region are included in Section 3.13.5, Regional Summary.

- Developed recreation sites on federal and state lands in the analysis area include campgrounds, picnic areas, information and interpretive sites, trailhead facilities, boat ramps, and fishing accesses. Federal agencies provide the majority of developed recreation facilities in the analysis area. City and county governments also provide public recreation facilities, consisting primarily of parks, trails, and open space areas. Privately owned recreation facilities in the analysis area include golf courses, private campgrounds, a hot springs, and facilities or services available through lodging providers. These facilities are listed by Project region in Section 3.13.5, Regional Summary.

Recreation opportunities also include special management areas designated by Federal agencies, including BLM special recreation management areas (SRMAs), historic trails, scenic byways, etc. Management of SRMAs focuses on providing special recreation opportunities that would not otherwise be available to the public, reducing conflicts among users, minimizing damage to resources, and reducing visitor health and safety problems. Recreation opportunities within or along these areas may be developed or dispersed. Recreation opportunities also are present on undesignated lands, which are those areas managed by a federal agency for which no special management exists.

Special Recreation Permits (SRP) are required for some recreation activities on BLM public lands. They are used to ensure public health and safety, protect recreation and natural resources, and ensure the public receives a fair monetary return for certain recreation uses of BLM public lands. SRPs are required for commercial activities, competitive events, certain organized group activities, and in some designated special areas. For NFS lands, Special Use Permits (SUPs) are issued for some recreational events.

3.13.4.3 Recreation Opportunity Spectrum Classes in the Analysis Area

The end product of recreation management is the experience people have, and the key to providing high quality recreation experiences and opportunities is the recreation setting and how it is managed. The Recreation Opportunity Spectrum (ROS) system is used by land managers to guide management of recreation settings and opportunities. ROS classifications may be incorporated into both BLM and USFS land use planning processes. The ROS provides levels of development, facility investment, and management intensity according to the different settings under each class. Typically, the ROS is divided into six or seven major classes described in **Table 3.13-4**. These classes include conditions that range from high-density urban environments to primitive settings. Physical, social, and managerial conditions will vary along this continuum. In general, the analysis area is located primarily along existing roadway and utility corridors that are characterized by the ROS classes Roaded Natural, Roaded Modified, or Rural.

Table 3.13-4 Recreational Opportunity Spectrum (ROS) Classifications

ROS Class	Setting Description		
	Sights and Sounds of Humans	**Motorized Use/Parking**	**Area Characterization**
Urban	Predominant	Facilities for highly intensified motor use and parking are available	Large numbers of users can be expected, substantially urbanized environment although the background may have natural appearing elements
Rural	Readily evident	Facilities for intensified motorized use and parking are available	Considerable number of facilities are designated for use by a large number of people, moderate densities are provided far away from developed sites and facilities, substantially modified natural environment
Roaded Modified	Similar to the Roaded Natural setting, except this area has been heavily modified (roads or recreation facilities). This class still offers opportunity to have a high degree of interaction with the natural environment and to have moderate challenge and risk and to use outdoor skills.		

Table 3.13-4 Recreational Opportunity Spectrum (ROS) Classifications

ROS Class	Setting Description		
	Sights and Sounds of Humans	Motorized Use/Parking	Area Characterization
Roaded Natural	Moderate evidence	Conventional motorized use is provided for in construction standards and design of facilities	Interaction between users may be low to moderate, but with evidence of other users prevalent, predominantly natural appearing environment
Semi-primitive Motorized	Often evidence of other users	Motorized use may be evident	Concentration of users is low, predominantly natural or natural-appearing environment
Semi-primitive Non-motorized	Often evidence of other users	Public motorized use is not permitted	Interaction between users is low, predominantly natural or natural-appearing environment
Primitive	Minimal evidence of other users	Motorized use is not permitted	Interaction between users is very low, essentially unmodified natural environment

The Fishlake, Uinta, Ashley, and Manti-La Sal national forests all utilize ROS classes to manage recreation. Although the Dixie National Forest LRMP does not utilize ROS classes, it does include developed recreation, semi-primitive recreation, and roaded natural recreation classifications that relate closely to ROS classes. Currently, most BLM field offices in the analysis area include very limited, if any, implementation of ROS in the RMPs; however, the Rawlins Field Office uses a ROS system comprising Primitive, Front Country, and Middle Country designations to guide recreation decisions within the Adobe Town DRUA. These designations are roughly analogous to the primitive, semi-primitive motorized, and roaded natural ROS categories described above.

3.13.4.4 Special Recreation Management Areas

The BLM designates recreation management areas where recreation and visitor services objectives are recognized as a primary resource management consideration and specific management is required to protect the recreation opportunities. Such recreation management areas are designated as either a SRMA or an Extensive Recreation Management Area (ERMA). SRMAs recognize unique and distinctive recreation values and are managed to enhance a targeted set of activities, experiences, benefits, and recreation setting characteristics, which become the priority management focus. ERMAs recognize existing recreation use and demand, and are managed to sustain principal recreation activities and associated qualities and conditions of the ERMA, commensurate with management of other resources (BLM 2011b). In some BLM Field Offices, all recreation areas not located within a SRMA are considered an ERMA. Generally, recreation opportunities in ERMAs are dispersed, unstructured activities that do not require intensive management or substantial investment in trails or facilities.

There are no designated recreation management areas on NFS lands within the analysis area.

SRMAs or ERMAs within the analysis area are identified for each Project region in Section 3.13.5, Regional Summary.

National Recreational Areas

NRAs are congressionally designated recreation areas, often centered on large reservoirs and emphasizing water-based recreation. Congressionally designated units of the NPS, including national recreation areas, and other similar Congressionally designated areas under the management of other agencies, have a higher level of national significance and protection than agency-designated land use classifications. Within the analysis area, the Lake Mead NRA is operated by the NPS and is located in southeastern Nevada and northwestern Arizona. The NRA encompasses two reservoirs (Lake Mead and Lake Mohave) formed by the Colorado River, which flows through Glen Canyon NRA and Grand Canyon National Park before reaching the Lake Mead NRA. The Lake Mead NRA contains 1,482,476

acres of federal land and 28,212 acres of nonfederal land. The Lake Mead NRA offers year-round recreational opportunities for boating, fishing, hiking, photography, picnicking and sightseeing. It also is home to thousands of desert plants and animals. A description of the portion of the Lake Mead NRA that is within the Region IV analysis area is included in Section 3.13.5, Regional Summary.

National and State Scenic Byways and Backways

The National Scenic Byways (NSB) Program was established under the Intermodal Surface Transportation Efficiency Act of 1991 and reauthorized in 1998 under the Transportation Equity Act for the 21st Century. Under the program, the U.S. Secretary of Transportation recognizes certain roads as National Scenic Byways or All-American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities.

To be considered for designation within the National Scenic Byways Program, a road must possess characteristics of regional importance within at least one of the six intrinsic quality categories identified above. Roads designated as All-American Roads must possess at least two of these intrinsic qualities at a level of national importance. Backways and byways are components of the National Scenic Byway Program that meet the byway criteria, but generally do not meet full federal safety standards, meaning they are not wide enough, graded enough, or level enough to be safe year-round for passenger cars. States or federal agencies such as the BLM also may designate scenic byways or backways. In general, the terms National Scenic Byway; All-American Road State Scenic Byway; Indian Tribe Scenic Byway; or USFS-, BLM-, BIA-, or NPS-designated Scenic Byway and Backway refer not only to the road or highway itself, but also to the corridor through which it passes.

The analysis area contains a number of scenic byways and backways. These roads and their intrinsic qualities are identified for each Project region in Section 3.13.5, Regional Summary. Section 3.12, Visual Resources, also contains information about the important landscapes viewed from scenic byways.

Designated National Trails and Other Recreational Trails

The National Trails System is a network of scenic, historic, and recreation trails created by the National Trails System Act of 1968 and amended in 1978 (NPS 2009).

- National recreation trails provide a variety of outdoor recreation uses in or reasonably accessible to urban areas.
- National scenic trail designation is extended to trails providing maximum outdoor recreation potential and conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which the trails may pass.
- National historic trail designation is extended to trails following as closely as possible and practicable to original trails or routes of travel of national historic significance.

There is one National Recreation Trail within the analysis area, the River Mountains Loop Trail, located near Las Vegas, Nevada. This 35-mile trail is a multi-use trail managed by the City of Henderson, Bureau of Reclamation, City of Boulder, and NPS. The River Mountains Loop Trail also is a National Millennium Trail. Impacts to this trail are discussed in Section 3.13.6.12, Region IV.

There is one National Scenic Trail that passes through the analysis area: the Continental Divide National Scenic Trail (CDNST). Impacts to this trail are discussed in Section 3.13.6.9, Region I.

The Old Spanish National Historic Trail crosses the analysis area at numerous locations in Utah and Nevada in Regions II, III, and IV. The Old Spanish Trail route was established along a network of Native American footpaths that crossed the expanse of the Colorado Plateau and the Mojave Desert. While there are public and private organizations offering interpretation and education, cultural

activities, and local heritage recreational events in some areas along the route (Old Spanish Trail Association 2011), the Old Spanish National Historical Trail is primarily a historic resource, not a recreational trail. Impacts to the Old Spanish National Historic Trail and other historic trails are therefore analyzed in Section 3.11, Cultural Resources and Native American Concerns, and Section 3.15, Special Designation Areas. However, it is unknown at this time if the segments of the historic trails/roads/highways crossed by the alternatives are contributing segments to these linear resources overall NRHP eligibility. Visual impacts to historic trails also are discussed in Section 3.12, Visual Resources.

State Wildlife Management Areas, Cooperative Wildlife Management Units, and State Parks

The analysis area contains two Wyoming state WHMAs, three Colorado SWAs, one hunting lease, and 23 units within the Utah wildlife management area (WMA) system. These wildlife management areas have been established to preserve fish and wildlife habitat and to provide recreational opportunities including fishing, hunting, and wildlife viewing. TWE would need to apply to the managing entity for access to a permanent ROW within WMAs. Because WMAs are often acquired with Federal Aid funds to protect wildlife habitat, the USFWS-Fed Aid would need to make a determination on whether or not the proposed access and ROW would compromise the purposes for which the property was acquired before TWE's application would be approved. Similarly, three of the WMAs totaling 6,900 acres are managed as partial mitigation for the Central Utah Project. These properties are a mix of State of Utah (39 percent) and Federal (61 percent) ownership. The Mitigation Commission, in consultation with the USFWS, would need to make a determination on whether or not the proposed access would compromise the purposes for which the properties were acquired and the appropriate compensatory mitigation that would be required should a ROW be approved.

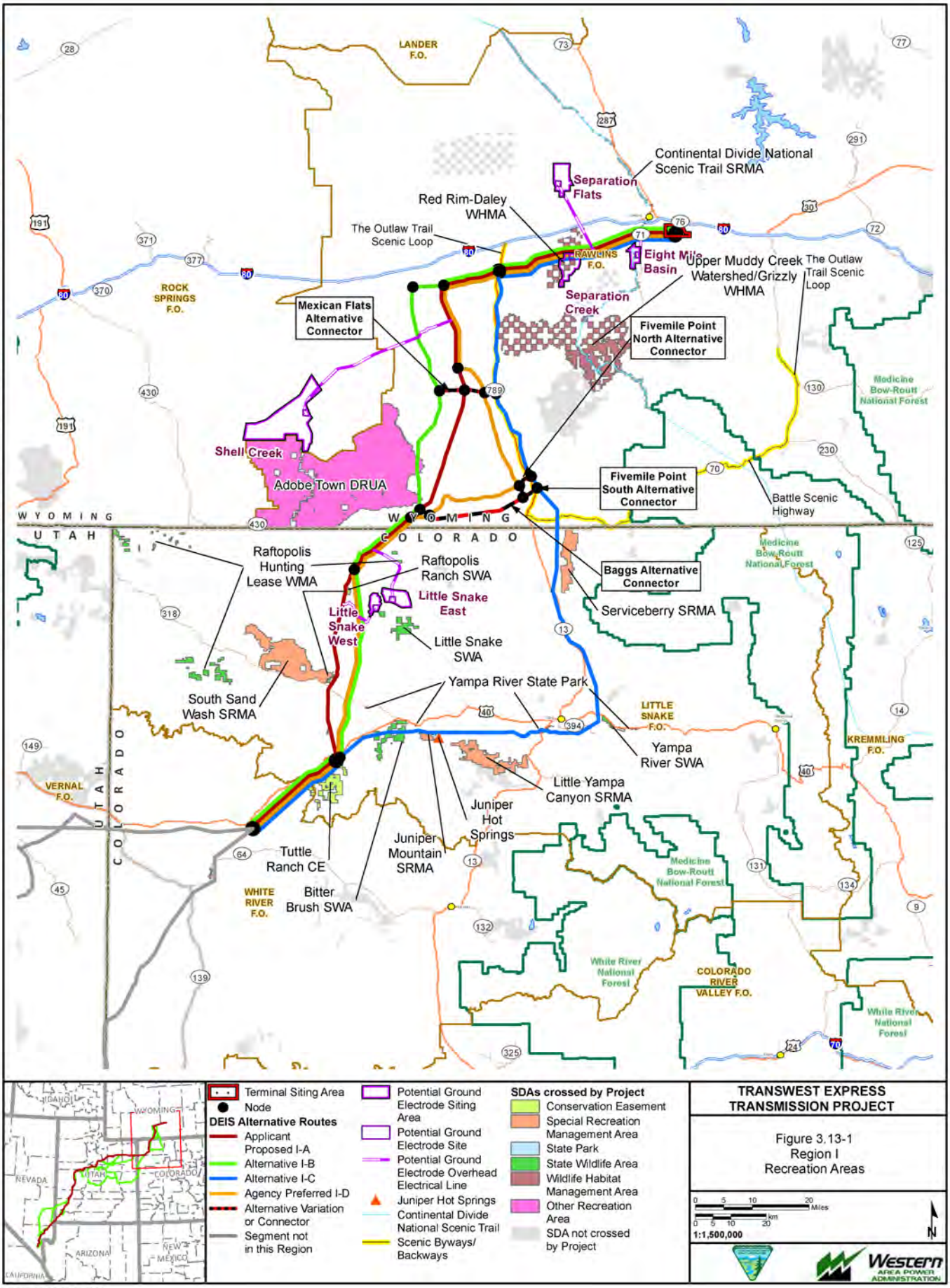
The analysis area also contains 15 cooperative wildlife management units (CWMUs) in Utah. These are hunting areas consisting of mostly private lands that have been authorized for the specific purpose of managing big game animals. CWMUs may have special management that would preclude development of roads or transmission lines. The analysis area also includes two state parks. WHMAs, SWAs, WMAs, CWMUs, and State Parks are described by Region in Section 3.15.3 and included in **Figures 3.13-1** through **3.13-5**.

Other Special Management Areas

In addition to designated recreation areas, there are federally designated special management areas within the analysis area where recreation occurs, including wilderness areas, WSAs, roadless areas, national monuments, and ACECs. These areas generally provide opportunities for solitude and dispersed recreation activities in a primitive setting, but are not managed primarily for recreation. Wilderness areas, WSAs, ACECs, roadless areas, national monuments, and other special designation areas are described in more detail in Section 3.15, Special Designations.

3.13.4.5 Off-Highway Vehicle Use on Dispersed and Specially Managed Recreation Areas

OHV use is one of the fastest growing recreational activities on public lands (USFS undated). Annual retail purchases of OHVs in the U.S. increased by 280 percent over a 10-year period from 368,600 OHVs in 1996 to 1,034,966 in 2006 (USFS 2006). OHV types used within the analysis area include all-terrain vehicles (ATV), cars/trucks/sport utility vehicles (SUV), motorcycles, and snowmobiles, though the majority of OHV participants in the analysis area use cars/trucks/SUVs. In addition to riding OHVs as a recreation activity, OHVs provide transport for non-recreation public uses such as grazing, oil and gas development, and other authorized uses of public lands (see Section 3.14, Land Use), as well as transport for recreation opportunities such as hunting, fishing, and camping. OHV use occurs both on- and off roads and trails as designated by federal agencies that manage land in the analysis area.



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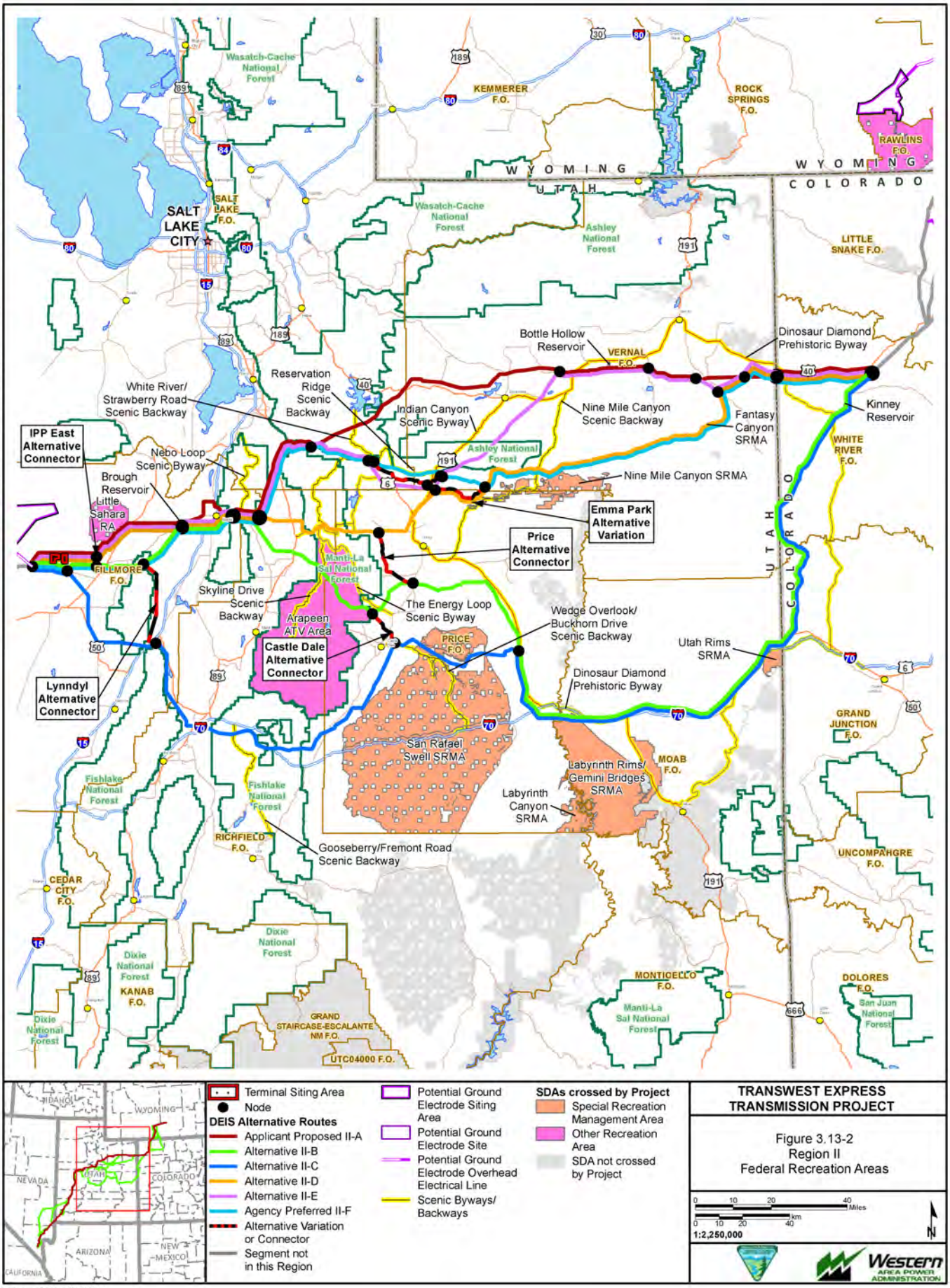
Wasatch-Cache National Forest
KEMMERER F.O.
ROCK SPRINGS F.O.
RAWLINS F.O.
WYOMING
UTAH
COLORADO
SALT LAKE CITY
SALT LAKE F.O.
Ashley National Forest
LITTLE SNAKE F.O.
Bottle Hollow Reservoir
VERNAL F.O.
Dinosaur Diamond Prehistoric Byway
Reservation Ridge Scenic Backway
White River/ Strawberry Road Scenic Backway
Indian Canyon Scenic Byway
Nine Mile Canyon Scenic Backway
Fantasy Canyon SRMA
Kinney Reservoir
WHITE RIVER F.O.
IPP East Alternative Connector
Nebo Loop Scenic Byway
Brough Reservoir
Little Sahara RA
Nine Mile Canyon SRMA
Emma Park Alternative Variation
Price Alternative Connector
FILLMORE F.O.
Manti-La Sal National Forest
Skyline Drive Scenic Backway
Arapeen ATV Area
The Energy Loop Scenic Byway
Wedge Overlook/ Buckhorn Drive Scenic Backway
Castle Dale Alternative Connector
PRICE F.O.
Utah Rims SRMA
Lynndyl Alternative Connector
Dinosaur Diamond Prehistoric Byway
GRAND JUNCTION F.O.
San Rafael Swell SRMA
MOAB F.O.
Labyrinth Rims/ Gemini Bridges SRMA
Fishlake National Forest
Labyrinth Canyon SRMA
RICHFIELD F.O.
Gooseberry/Fremont Road Scenic Backway
UNCOMPAHGRE F.O.
CEDAR CITY F.O.
Dixie National Forest
KANAB F.O.
MONTICELLO F.O.
DOLORES F.O.
San Juan National Forest
GRAND STAIRCASE-ESCALANTE NM F.O.
UTC04000 F.O.
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Scenic Byways/ Backways
SDAs crossed by Project
Special Recreation Management Area
Other Recreation Area
SDA not crossed by Project
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.13-2
Region II
Federal Recreation Areas
1:2,250,000
Western AREA POWER ADMINISTRATION
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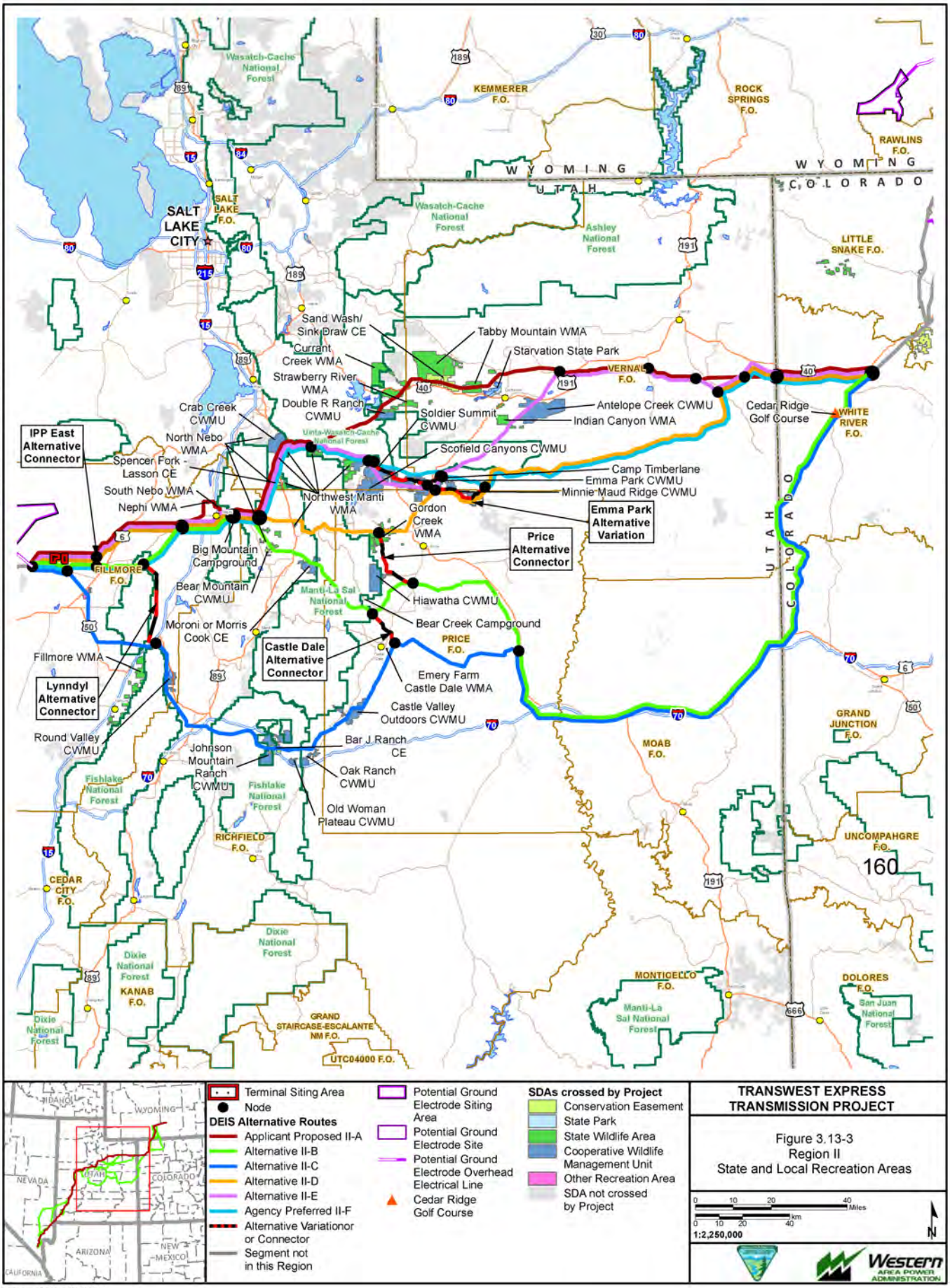

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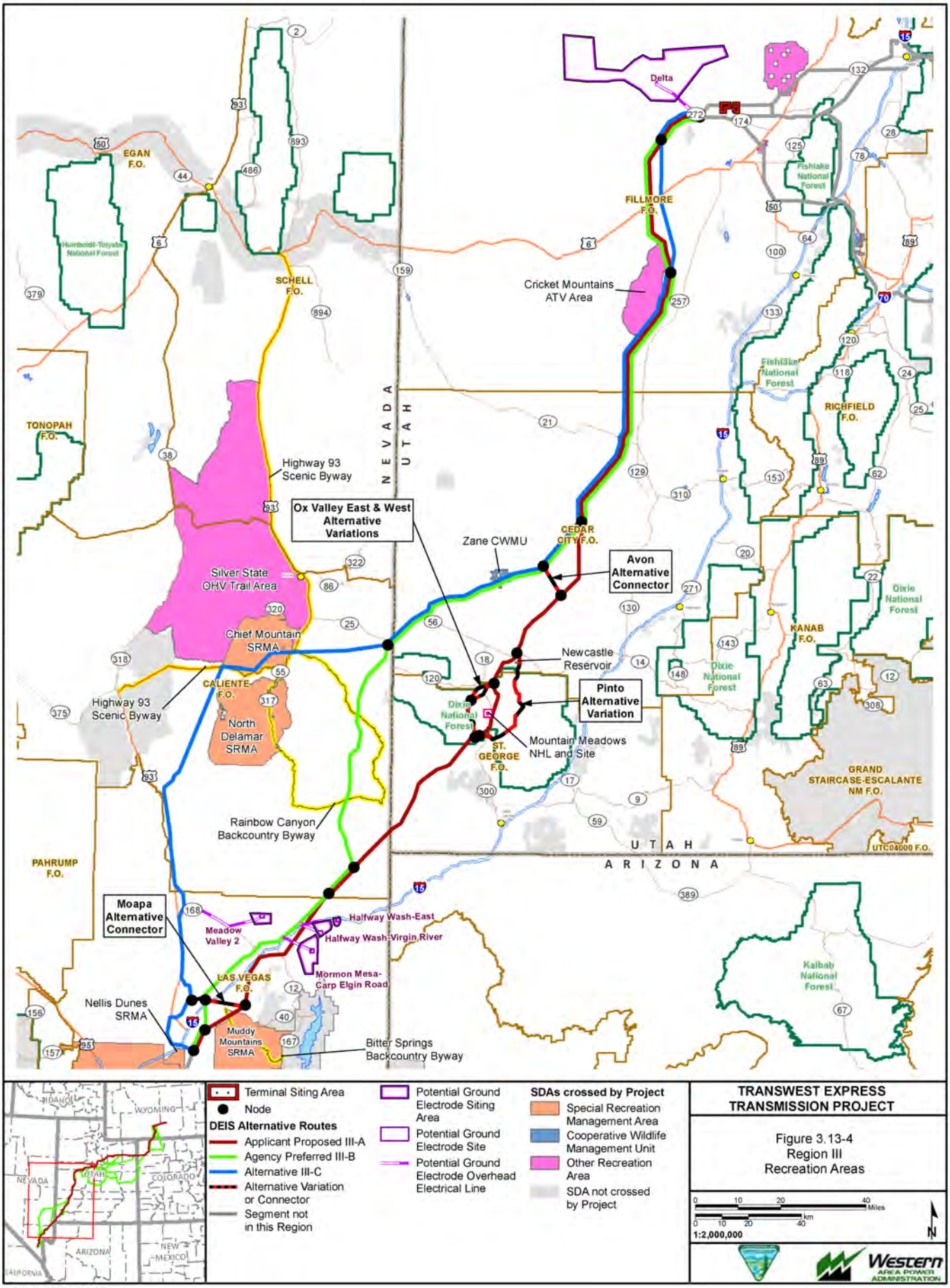

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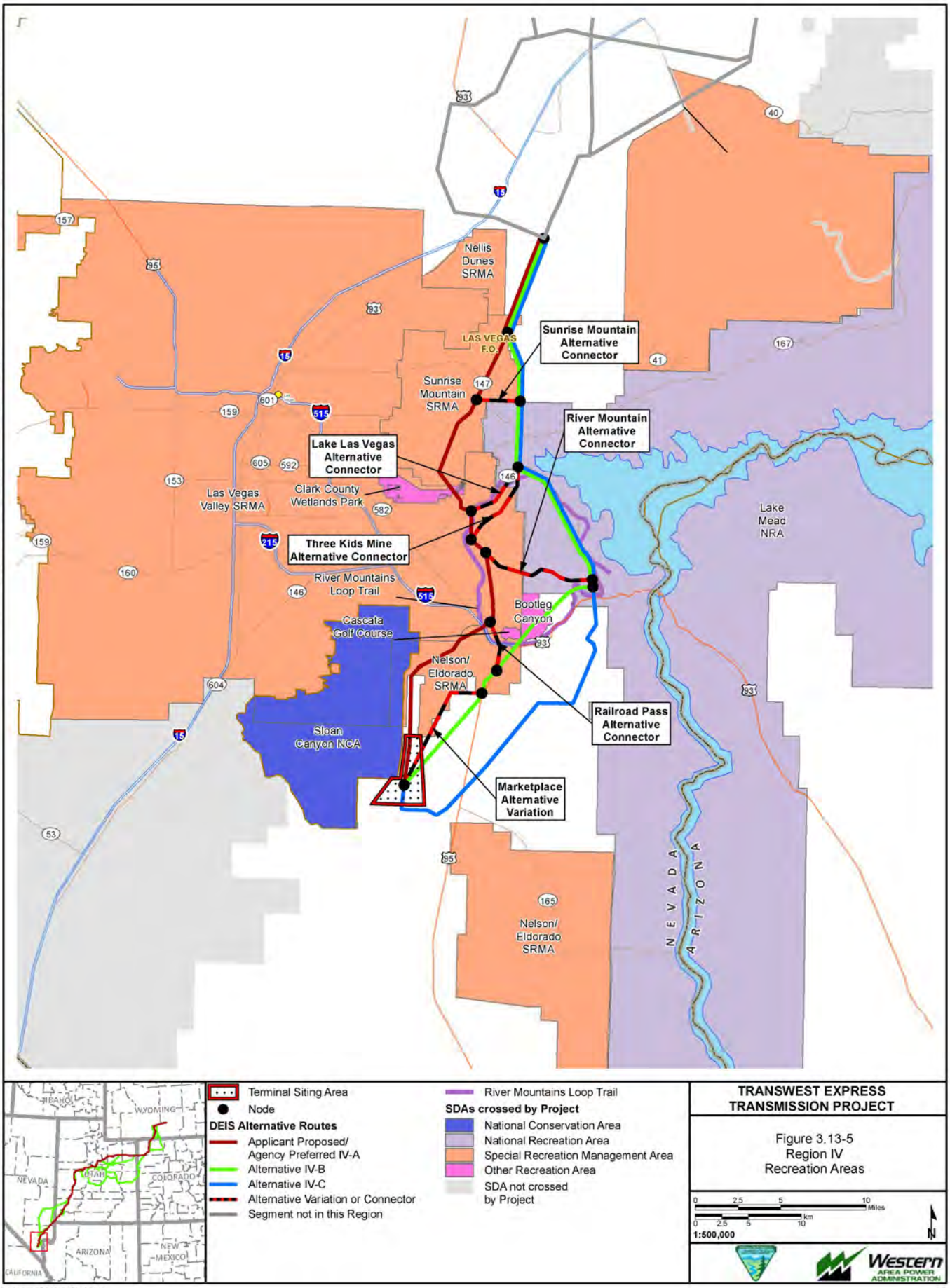

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Increasing OHV traffic on public lands has caused the uncontrolled proliferation of user-created, undesignated trails arising from repeated cross-country travel. Unauthorized motorized use causes natural resource damage (e.g., soils, habitat) and increased public safety concerns (USFS undated). In 1972, Executive Order No. 11644 was issued, requiring each federal agency to designate "areas and trails" for off-road vehicle use or restriction, and to develop regulations to implement the Executive Order (BLM 2001a). The BLM's regulations (43 CFR 8340) established management areas as either "open," "limited," or "closed" to off-road vehicle use.

- Open: an area where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards. The BLM designates areas as "open" for intensive off-road vehicle (ORV) use where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel.
- Limited: an area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following type of categories: numbers of vehicles; types of vehicles; time or season of vehicle use; permitted or licensed use only; use on existing roads and trails; use on designated roads and trails; and other restrictions. The agency designates areas as "limited" where it must restrict ORV use in order to meet specific resource management objectives. The BLM also may enact other limitations to protect resources, particularly in areas that motorized OHV enthusiasts use intensively or where they participate in competitive events.
- Closed: an area where ORV use is prohibited. The BLM designates areas as "closed" if closure to all vehicular use is necessary to protect resources, ensure visitor safety, or reduce use conflicts.

The BLM's OHV designations are determined through the land use planning process. A summary of OHV designations within the analysis area is included in the regional summaries contained in Section 3.13.5.

For lands within the NFS, each national forest or ranger district designates roads, trails, and areas as open or closed to motor vehicles. In general, OHV use within national forests is limited to existing or designated roads and trails. NFS road and trail designations include class of vehicle and, if appropriate, time of year for motor vehicle use. USFS travel designations are required to be shown on a motor vehicle use map (USFS 2011). Outside of BLM and USFS lands, some OHV use is allowed. A summary of OHV designations by agency is included in the regional summaries contained in Section 3.13.5, Regional Summary of Recreation Sites/Areas.

3.13.5 Regional Summary of Recreation Sites/Areas

Summaries of dispersed and developed recreation opportunities and special designated management areas are provided by Project Region in the sections below.

3.13.5.1 Region I

Within Region I, three BLM FOs provide a variety of recreation opportunities in Wyoming and Colorado: Rawlins, Little Snake, and White River. Recreation opportunities available on lands within the analysis area generally include hunting, fishing, geocaching, wildlife viewing, boating, hiking, mountain biking, horseback riding, rock hounding, camping, OHV use, and picnicking. BLM recreation lands contain almost no developed facilities. There are no USFS lands within the Region I analysis area. There is one NPS-managed national monument in the Region I analysis area (also discussed in Section 3.15, Special Designations). A brief description of dispersed recreation activities by BLM FO is included in **Table 3.13-5**. **Table 3.13-6** identifies all federally managed special recreation management areas within the Region I analysis area. There are no designated scenic byways and backways within the analysis area. **Figure 3.13-1** identifies all recreation areas within the Region I analysis area.

Table 3.13-5 Federally Managed Dispersed Recreation Opportunities within Region I Analysis Area

Managing Entity	Key Dispersed Recreation Activities within Analysis Area
BLM Rawlins FO, Wyoming	The FO encompasses approximately 3.5 million acres of BLM-managed public lands. Dispersed recreation activities on public lands include wildlife viewing, hunting, hiking, backpacking, OHV use, fishing, biking, photography, camping, orienteering, and floating. Access to public lands is limited due to the checkerboard pattern of land ownership. Access for dispersed recreation occurs through Carbon County roads and BLM roads, the CDNST (discussed below), the North Platte River, and across public lands. Hunting occurs on federal land sections that are accessible by public roads or with permission of the private landowner. OHV use is limited to existing roads and vehicle routes within the checkerboard area and limited to designated roads and trails between the checkerboard area and the state line. The analysis area includes portions of the 238,970-acre Adobe Town Dispersed Recreation Use Area, which is managed to provide dispersed recreation in an undeveloped recreation setting. The Rim Lake recreation site, a small day use and fishing area, also is located within the analysis area. The analysis area also includes portions of the Battle Scenic Highway and Outlaw Trail Scenic Loop, which are not designated national scenic byways, but are recommended recreational driving routes.
BLM Little Snake FO, Colorado	The FO encompasses approximately 1,336,900 acres of BLM-managed public lands. Dispersed recreation activities on public lands include hunting, fishing, geocaching, wildlife viewing, boating, hiking, mountain biking, horseback riding, rock hounding, camping, OHV use, and picnicking. Hunting is a popular recreation activity. The area west of Craig/Maybell is excellent for pronghorn antelope hunting. OHV use is limited to existing roads and trails pending transportation planning; the Juniper Mountain SRMA is limited to designated roads and trails. The Yampa River is very popular for fishing, boating and floating, especially on weekends. The Yampa River is one of the most hydrologically and biologically intact rivers in the West. The portion of the Yampa River between Craig and Maybell receives intensive recreation use and is renowned for its high quality scenery and recreation opportunities. The area contains several special management areas (discussed below). Equestrian activities on public lands in the Little Snake Resource Area generally occur on existing roads and trails or open country areas. Popular equestrian areas exist in the South Sand Wash and Little Yampa Canyon SRMAs (discussed below).
BLM White River FO, Colorado	The FO encompasses 1.5 million acres of BLM-managed public lands. Dispersed recreation activities are available in the analysis area.

Sources: BLM 2012a,b,c,d; 2011c; 2008a; 1987a; Public Lands Information Center 2013.

Table 3.13-6 Federally Managed Special Recreation Management Areas within Region I Analysis Area

Managing Entity	Recreation Site/Area[1]	Description
BLM Rawlins FO, Wyoming	CDNST SRMA	600-acre SRMA containing about 82 miles of trail. Recreation activities on the trail include hiking, mountain biking, horseback riding, and limited motor vehicle use. The 3,100-mile CDNST runs along the Rocky Mountains from Canada to Mexico and is managed to provide high quality primitive hiking and horseback riding opportunities in diverse country along the trail, and to conserve natural, historic, and cultural resources along the trail corridor (USFS 2009a). Within the SRMA, the BLM Rawlins FO manages the trail to emphasize interpretive and educational opportunities and to ensure the continued availability of outdoor recreation opportunities associated with the trail. Recreation activities within the SRMA include backpacking, mountain biking, camping, hunting, OHV use, picnicking, and wildlife viewing. The SRMA is an avoidance area for linear utility systems.

Table 3.13-6 Federally Managed Special Recreation Management Areas within Region I Analysis Area

Managing Entity	Recreation Site/Area[1]	Description
BLM Little Snake FO, Colorado	South Sand Wash SRMA	35,510 acres. Recreation activities in the SRMA include wildlife viewing, hunting, rock hounding, mountain biking, camping, antler gathering, and OHV use. Zone 1: open off-road motorized recreation. Zone 2: single-track and double-track OHV riding, limited to designated roads and trails. Physical, social, and administrative prescribed setting character is rural; near improved country roads and a highway, large groups and conspicuous and large-scale landscape alteration.
	Juniper Mountain SRMA	1,780 acres. Recreation activities in the SRMA include boating, hunting, camping, and hiking. ROW avoidance area. Zone 1: Day use motorized and non-motorized boating. Zone 2: Hunting (national- and regional-level destination big game hunting), camping, hiking, and horseback riding. The physical setting character is natural landscape with some primitive and maintained roads and trails. The social and administrative setting is backcountry, where encounters with other people will be from 3 to 6 people and landscape alterations are uncommon.
	Serviceberry SRMA	12,375 acres. Zone 1: Non-motorized hunting and heritage interpretation/education. Zone 2: Non-motorized big game hunting and undeveloped camping in a backcountry setting.
	Little Yampa Canyon SRMA	27,310 acres. Managed to provide river boating, big game hunting, camping, wildlife viewing, and interpretation/education opportunities for local communities and visitors to the area. VRM Class II for areas within line of sight from the river within the SRMA; VRM Class III elsewhere.
	Yampa Valley Trail	100-mile motorized and non-motorized trail along the Yampa River. Recreation uses on the trail include mountain biking, horseback riding, hiking, wildlife viewing, and OHV use. Includes the East and West Juniper Mountain trailheads.
NPS	Dinosaur National Monument	Dinosaur National Monument consists of 209,444 acres and offers a variety of recreation opportunities, including river rafting on the Green and Yampa Rivers, scenic driving, stargazing, hiking, bicycling, camping, fishing, horseback riding, snowmobiling, snowshoeing, cross-country skiing, and fossil viewing. The monument also offers guided tours.

[1]Within each BLM FO, other specially designated areas, such as WSAs, WSRs, wilderness areas, or ACECs have recreational use, but are not designated specifically for recreational use. These other areas are analyzed in Section 3.15, Special Designations.

Sources: BLM 2012a,b,c,d, 2011c, 2008a, 1987a; NPS 2013b.

Within the Wyoming portion of the analysis area, Wyoming Game and Fish manages two WHMAs within the region primarily for hunting. Within the Colorado portion of the analysis area, CPW manages one state park, which includes several popular recreation access points along the Yampa River; three SWAs; and portions of State Trust lands that are part of the Public Access Program and are available for hunting, wildlife viewing, and fishing. One private recreation site also is located in Region I, Juniper Hot Springs. **Table 3.13-7** provides a list of all state managed recreation areas within the analysis area, including key resource values and recreation activities.

Table 3.13-7 State and Locally Managed Recreation Areas within Region I Analysis Area

Managing Entity	Management Area	Description
Wyoming Game and Fish	Red Rim – Daley WHMA	25,177 acres. Provides crucial winter habitat for pronghorn antelope and a variety of other wildlife. Open all year, however, drifting snow closes most trails in early winter. Recreation activities include hunting (elk, deer, antelope, moose, and upland game birds), camping, hiking, and wildlife viewing.

Table 3.13-7 State and Locally Managed Recreation Areas within Region I Analysis Area

Managing Entity	Management Area	Description
Wyoming Game and Fish (Continued)	Upper Muddy Creek Watershed/Grizzly WHMA	59,783 acres. Utility ROW avoidance area. Managed for Colorado River fish species unique to the Muddy Creek watershed and for crucial winter habitat for elk and mule deer. Motorized vehicle use is limited to designated roads and vehicle routes. Surface disturbing activities buffers exist around aquatic resources.
Colorado Parks and Wildlife	Bitter Brush SWA	8,057 acres. Recreation activities include hunting (deer, elk, and pronghorn) and wildlife viewing. Public access is prohibited from January 15 through April 30. Vehicle access is restricted to Moffat County Roads 59 and 143.
	Little Snake SWA	5,501 acres. Recreation activities include hunting, camping, hiking, and wildlife viewing.
	Yampa River SWA	860 acres. Recreation activities include northern pike fishing, waterfowl hunting, wildlife-watching, and boating. Area includes put-in and take-out access point for boaters.
	Raftopolous Hunting Lease	11,383 acres. CDOW conservation easement on private lands for hunting use.
	Yampa River State Park	Park comprises a 134-mile-long portion of the river, stretching from Hayden, Colorado to Dinosaur National Monument on the Utah border. There are 13 river access points, six of which are within the analysis area (from east to west): • Yampa River SWA (see above) • South Beach (Pump Station) Access Point: 3 miles south of Craig. Offers fishing, camping, and boat launching. Access from this point offers an opportunity to float into "Little Yampa Canyon," a 32-mile stretch of river to the next access point. • Juniper Mountain Access Point: 20 miles west of Craig. Offers camping, picnicking, fishing, boat launching, and wildlife viewing. • Maybell Bridge Access Point: In Maybell. Improved site, offers picnic sites and overnight camping. • Sunbeam Access Point: 7 miles northwest of Maybell. Primarily for boat launching; minimal facilities and no overnight camping. • East Cross Mountain Access Point: 18 miles southwest of Maybell. Improved site, camping permitted.
Private	Juniper Hot Springs	Located south of Maybell, Colorado. Several mineral spring pools are available and camping is allowed.

Sources: AllTrips Steamboat Springs Colorado 2011; BLM 2008a; CDOW 2011, 2010, 2009; CPW 2012, 2011a,b; Craig Chamber of Commerce 2012; Field and Stream 2010; Juniper Hot Springs 2013; WGFD 2011, 2008.

3.13.5.2 Region II

Recreation opportunities within this region are provided by a variety of entities, including eight BLM FOs, four national forests, the Utah Division of Wildlife Resources, the Utah Division of State Parks and Recreation, one county, one tribe, and several private entities/associations. Recreation opportunities on lands within the analysis area include: OHV use, fishing, boating, camping, picnicking, hunting, hiking, horseback riding, mountain biking, scenic driving, and wildlife viewing. Only a few recreation sites within the region contain developed facilities. The region includes 17 WMAs/units in Utah that primarily provide hunting and wildlife viewing opportunities. In addition, the Utah Cooperative Wildlife Management Association manages 14 hunting units in the region. Emery County, the Church of Jesus Christ of Latter-Day Saints, and a private company operate three campgrounds within the region. Brief descriptions of dispersed and developed recreation opportunities by BLM FO and national forest are included in **Tables 3.13-8** and **3.13-9**. **Table 3.13-10** identifies scenic byways and BLM backways within the Region II analysis area. **Table 3.13-11** identifies all

federally managed special recreation management areas within the Region II analysis area, and **Table 3.13-12** identifies all state and locally managed recreation areas within the Region II analysis area. **Figure 3.13-2** identifies all federally managed recreation areas within the Region II analysis area. **Figure 3.13-3** identifies all state and locally managed recreation areas within the Region II analysis area.

Table 3.13-8 BLM-Managed Recreation Opportunities within Region II Analysis Area

Managing Entity	Key Recreation Activities within Analysis Area
White River FO, Colorado	1.5 million acres of BLM-managed public lands. Recreation activities available in the analysis area include fishing and boating on the White River, and at Kinney Reservoir, as well as big game and mountain lion hunting, rock crawling, scenic driving, cultural tourism, and OHV use.
Grand Junction FO, Colorado	1,280,000 acres of BLM-managed public lands. Recreation activities in the north desert area include motorized uses, including an open OHV use area, hunting, and recreational shooting. Within the Book Cliff area, recreation activities include wild horse viewing, hiking, and horseback riding.
Moab FO, Utah	1.8 million acres of BLM-managed public lands, which are a destination recreation area with two million annual site visits. Recreation activities support hundreds of local jobs and the bulk of the local business community. Recreation opportunities include mountain biking; dirt bike, OHV and jeep use; rock climbing; river rafting; casual sightseeing; and hiking. The FO experiences a high number of seasonal visitors and an intense demand for recreational activities. Busy seasons include both spring and fall, with spring bringing the most visitors to the area. Summer visitation is mainly associated with touring the nearby National Parks and with river-related activities.
Vernal FO, Utah	1,697,039 acres of BLM-managed public lands. Recreation opportunities within the FO area include bird watching, camping, fishing, hiking, river running on the Green River, hunting, mountain biking, recreational driving, OHV use, and historical tourism. The analysis area contains a portion of the Dinosaur Diamond Prehistoric Byway.
Price FO, Utah	2,479,000 acres of BLM-managed public lands. Recreation activities include camping, hunting, fishing, hiking, horseback riding, rock climbing, mountain biking, caving, river running, wildlife viewing, visiting historic sites, sailing, OHV use, and fishing and boating on the Green River, Price River, and San Rafael River. Historical tourism is available at dinosaur quarries and provides examples of prehistoric Fremont Culture. Key recreational areas include the San Rafael Swell, which is 2,000 square miles of public land known for its scenic sandstone formations, deep canyons, desert streams, and expansive panoramas. The analysis area contains a portion of the Energy Loop: Huntington/Eccles Canyons Scenic Byway, the Wedge Overlook/Buckhorn Drive Scenic Backway, and the Nine Mile Canyon Scenic Backway.
Richfield FO, Utah	2.1 million acres of BLM-managed public lands. Recreation activities include bird watching, camping, hiking, OHV activities, horseback riding, whitewater boating, and recreational driving. Recreational opportunities are generally dispersed and without constructed facilities.
Salt Lake FO, Utah	2 million acres of BLM-managed public lands. Recreation opportunities in the analysis area include camping, scenic backcountry driving, OHV use, hiking, horseback riding, hunting, mountain biking, rock climbing, wilderness backpacking, wildlife viewing, nature photography, rock hounding, and geocaching.
Fillmore FO, Utah	4.7 million acres of BLM-managed public lands located on the eastern edge of the Basin and Range Geographic Province. Portions of the FO are in both Region II and Region III. Dispersed recreation opportunities within the Region II portions of the FO include hunting, fishing, hiking, round hounding, and OHV use, including 60,000 acres of sand dune riding in the Little Sahara Recreation Area.

Sources: BLM 2012d,e,f,g,h,i,j,k; 2008b,c,d,e; 1997b; 1990; 1987a,b,c; Emery County 2012.

Table 3.13-9 Forest Service-Managed Recreation Opportunities within Region II Analysis Area

<table>
<tr><th>National Forest</th><th>Key Recreation Activities within Analysis Area</th></tr>
<tr><td>Ashley National Forest</td><td>1.4 million acres of USFS-managed public lands. Recreation opportunities within the analysis area are dispersed and include hiking, camping, OHV use, hunting, fishing, and wildlife viewing. Recreation activities mostly occur along the Sowers Canyon Road (NFSR 10152) at the forks of drainages to the canyon. The upper areas of the IRA are used very little due to steep terrain and limited access. The analysis area includes the Indian Canyon Scenic Byway and portions of the Reservation Ridge Scenic Backway. The analysis area includes portions of the Duchesne/Roosevelt Ranger District and does not contain any developed recreations sites. The Avintaquin Campground is located just outside of the analysis area.
Considered as a whole, the Ashley National Forest contains the following acreage by ROS class:
<table>
<tr><td>Urban</td><td>N/A</td><td>0%</td></tr>
<tr><td>Rural</td><td>N/A</td><td>0%</td></tr>
<tr><td>Roaded Modified</td><td>N/A</td><td>0%</td></tr>
<tr><td>Roaded Natural</td><td>454,465 acres</td><td>32%</td></tr>
<tr><td>Semi-primitive Motorized</td><td>280,820 acres</td><td>20%</td></tr>
<tr><td>Semi-primitive Non-motorized</td><td>372,415 acres</td><td>26%</td></tr>
<tr><td>Primitive</td><td>300,040 acres</td><td>21%</td></tr>
<tr><td>Non-inventoried, unknown, or private</td><td>3,379 acres</td><td><1%</td></tr>
<tr><td>TOTAL</td><td>1,407,743 acres</td><td>100%</td></tr>
</table>
The analysis area includes acreage within roaded natural, semi-primitive motorized, and semi-primitive non-motorized ROS classes.</td></tr>
<tr><td>Fishlake National Forest</td><td>1.8 million acres of USFS-managed public lands. Analysis area includes portions of the Richfield Ranger District and Fillmore Ranger District. Recreation opportunities within the analysis area include fishing, hunting, camping, hiking, horseback riding, prospecting, rock hounding, OHV use, and snowmobiling. Key OHV areas include the Great Western Trail /Paiute ATV Trail, Gooseberry ATV Trail, and Gooseberry Fishlake Trail. The Maple Grove picnic area and campground are located just outside of the analysis area. The analysis area includes portions of the Gooseberry/Fremont Road Scenic Backway.
Considered as a whole, the Fishlake National Forest contains the following acreage by ROS class:
<table>
<tr><td>Urban</td><td>N/A</td><td>0%</td></tr>
<tr><td>Rural</td><td>10,838 acres</td><td>1%</td></tr>
<tr><td>Roaded Modified</td><td>N/A</td><td>0%</td></tr>
<tr><td>Roaded Natural</td><td>523,803 acres</td><td>29%</td></tr>
<tr><td>Semi-primitive Motorized</td><td>1,055,681 acres</td><td>58%</td></tr>
<tr><td>Semi-primitive Non-motorized</td><td>195,979 acres</td><td>11%</td></tr>
<tr><td>Primitive</td><td>N/A</td><td>0%</td></tr>
<tr><td>Non-inventoried, unknown, or private</td><td>32,231 acres</td><td>2%</td></tr>
<tr><td>TOTAL</td><td>1,818,532 acres</td><td>100%</td></tr>
</table>
The analysis area includes acreage within roaded natural, semi-primitive motorized, and semi-primitive non-motorized ROS classes.</td></tr>
<tr><td>Manti-La Sal National Forest</td><td>1.4 million acres of USFS-managed public lands. The analysis area includes portions of the Sanpete Ranger District and Ferron-Price Ranger District. Recreation activities include hunting, fishing, mountain biking, hiking, horseback riding, snowmobiling, camping, scenic driving, and OHV use. Key OHV areas include the Arapeen ATV trail system, which includes over 350 miles of ATV and OHV roads, and the Great Western Trail. Scenic driving opportunities in the analysis area include the Skyline Drive Scenic Backway and Energy Loop/Huntington-Eccles Canyons Scenic Byway. Developed facilities within the analysis area include the Indian Creek Group Campground, Potter's Pond Campground, North Skyline Winter Staging Area, Gooseberry Campground, Flat Canyon Campground, Boulger Reservoir, Wasatch Academy (operated through special use permit), and Electric Lake Reservoir. Beaver Dam Reservoir, Gooseberry Reservoir area, and the Fairview Lakes also are located just outside the analysis area.
Considered as a whole, the Manti-La Sal National Forest contains the following acreage by ROS class:
<table>
<tr><td>Urban</td><td>N/A</td><td>0%</td></tr>
<tr><td>Rural</td><td>809 acres</td><td>0%</td></tr>
<tr><td>Roaded Modified</td><td>N/A</td><td>0%</td></tr>
<tr><td>Roaded Natural</td><td>502,186 acres</td><td>36%</td></tr>
<tr><td>Semi-primitive Motorized</td><td>705,230 acres</td><td>50%</td></tr>
<tr><td>Semi-primitive Non-motorized</td><td>77,626 acres</td><td>5%</td></tr>
<tr><td>Primitive</td><td>49,449 acres</td><td>3%</td></tr>
<tr><td>Non-inventoried, unknown, or private</td><td>79,182 acres</td><td>6%</td></tr>
<tr><td>TOTAL</td><td>1,414,482 acres</td><td>100%</td></tr>
</table>
The analysis area includes acreage within rural, roaded natural, semi-primitive motorized, and semi-primitive non-motorized ROS classes.</td></tr>
</table>

Table 3.13-9 Forest Service-Managed Recreation Opportunities within Region II Analysis Area

National Forest	Key Recreation Activities within Analysis Area
Uinta National Forest*	Approximately 980,000 acres of USFS-managed public lands (not including the Wasatch and Cache national forests). The analysis area includes portions of the Spanish Fork Ranger District and Heber Ranger District. Recreation activities include OHV use, mountain biking, scenic driving, hiking, and horseback riding. Key recreation areas within the analysis area include Strawberry Reservoir, Strawberry River Day Use Area (used to access the Strawberry River WMA, a designated Blue Ribbon fishery), Aspen Grove Campground and Reservoir Marina, portions of the Strawberry OHV Trail System and Sheep Creek Snowmobiling area, several trails (Willow Creek, Teat Mountain, and Long Hollow), and the Great Western Trail. The analysis area includes portions of the White River/Strawberry Road Scenic Backway, the Nebo Loop National Scenic Byway, and the Reservation Ridge Scenic Backway. Considered as a whole, the Uinta National Forest contains the following acreage by ROS class:

Urban	N/A	0%
Rural	1,655 acres	<1%
Roaded Modified	85,222 acres	9%
Roaded Natural	274,406 acres	28%
Semi-primitive Motorized	354,817 acres	36%
Semi-primitive Non-motorized	122,676 acres	12%
Primitive	58,687 acres	6%
Non-inventoried, unknown, or private	86,345 acres	9%
TOTAL	983,808 acres	100%

The analysis area includes acreage within rural, roaded modified, roaded natural, semi-primitive motorized, semi-primitive non-motorized and primitive ROS classes.

* Only recreation resources within the Uinta National Forest, as identified in the Uinta National Forest LRMP, are within the analysis area. Therefore, all subsequent references to the Uinta-Wasatch-Cache National Forest will be only to the Uinta National Forest, which may differ from other resource sections.

Sources: Emery County 2012; USFS 2013, 2012a,b,c,d,e, 2003, 1986a,b,c.

Table 3.13-10 Scenic Byways and BLM Backways within Region II Analysis Area

Name	Length/Designation	Description
Dinosaur Diamond Prehistoric Byway	480-mile National Scenic Byway within western Colorado and eastern Utah	The route passes by numerous sites where dinosaur bones and tracks are visible in the ground. There are many museums along the route that provide opportunities to see and learn about dinosaurs.
The Energy Loop/Huntington-Eccles Canyons Scenic Byway	83-mile National/Utah/National Forest Scenic Byway between Huntington, Fairview, and Colton primarily through the Manti-La Sal National Forest	Passes by historical industrial development resources including coal mining operations, historic mining towns, and coal-fired power plants. Nearby Sanpete Valley contains some of the best-preserved Mormon Pioneer settlements in existence.
Indian Canyon Scenic Byway	47-mile National/Utah State Scenic Byway crossing the Ashley National Forest between Helper and Duchesne	Passes by a unique display of rock formations and vegetation types, from pinyon and juniper to aspen and Douglas fir. Elk and deer are often seen along the route and the contrasts of autumn foliage are particularly beautiful. From the summit, the road follows Indian Canyon through desert terrain bordering Indian Creek. Offers access to recreation areas within the Ashley National Forest. This route is a portion of the Dinosaur Diamond Prehistoric Highway.
Reservation Ridge Scenic Backway	45-mile Utah/National Forest Backway between Soldier Summit on Highway 6 to U.S. 191	The route roughly parallels the Right Fork of the White River at first, as it climbs up to 8,900 feet, offering dramatic views of Strawberry Reservoir, then curving south through aspen and pine stands perched on top of the plateau, where openings provide more views of rugged cliffs and steep canyons.
Gooseberry/Fremont Road Scenic Backway	40-mile Utah Scenic Backway between Fremont, Utah, and Salina, Utah	Route travels through the Fishlake National Forest through mountain meadows cut by streams, offering recreation opportunities at Johnson Valley Reservoir, Lost Creek Reservoir, Rex Creek Reservoir, Sevenmile Creek, and the Gooseberry Ranger Station.
Wedge Overlook/ Buckhorn Drive Scenic Backway	Utah Scenic Backway; 20-mile and 25 mile segments located northeast of Castle Dale, along the San Rafael River	Vantage points along the rim of the San Rafael Swell provide views down canyon after canyon. Wedge Overlook offers a view down the "Little Grand Canyon," where the San Rafael River winds 1,200 feet below. Buckhorn Draw Road slowly descends through a narrow sandstone canyon, intersecting the river at points, and then reaching the interstate through open rangeland.

Table 3.13-10 Scenic Byways and BLM Backways within Region II Analysis Area

Name	Length/Designation	Description
Nine Mile Canyon Scenic Backway	78-mile National Backcountry Byway/Utah Scenic Backway between Price, Utah, and Myton, Utah	Passes through a major representative area of the prehistoric Fremont Culture. The canyon houses a myriad of rock panels along the main road and in side canyons. Petroglyphs (carvings on rock faces) and pictographs (paintings on rock faces) depict animals, hunting scenes, and godlike figures. Cliff granaries on high canyon ledges may be spotted by careful observers. Vegetation and terrain along this backway vary from high desert species to aspen groves. The buff colored cliffs of the canyon are highlighted by balanced rocks and window arches. Deer and elk are seen frequently. A number of side canyons branch off Nine Mile Canyon itself; rock art sites are frequently located near those junctions.
Skyline Drive Scenic Backway	86-mile Utah Scenic Backway between the Highway 6 Tucker rest stop along I-70 through the Manti-La Sal National Forest	Mountain road that follows the spine of the Wasatch Plateau climbing to an elevation of 11,000 feet and offering panoramic views of Sanpete Valley, mile-deep canyons, lake-filled basins and alpine meadows and forests. The route is accessible July through September. High clearance 4-wheel drive vehicles are required. The Skyline Drive corridor contains portions of the Great Western Trail.
White River/Strawberry Road Scenic Backway	28-mile Utah Scenic Backway between Soldier Summit on Highway 6 and Strawberry Reservoir	The road travels along the Left Fork of the White River, ascending 1,100 feet through the open fields of sage and grass, with stands of pine and aspen at higher elevations. At the terminus of the road is Strawberry Reservoir and Strawberry Bay, which are both fully developed for boating, fishing, camping, and picnicking.
Nebo Loop Scenic Byway	37-mile National Scenic Byway in Utah crossing the Uinta National Forest between the cities of Nephi and Payson	Route provides views of the Wasatch Range and 11,929-foot Mt. Nebo. Flat bottomlands, high-alpine conifers, red rock formations, gray sandstone cliffs and salt flats. Sites visible from the route include Devil's Kitchen, Walk Flat, and Mt. Nebo Wilderness.

Sources: Dinosaur Diamond 2012; Gorp.com 2012; Public Land Information Center 2012; Trails.com 2012; USDOT 2012, Utah.com 2012.

Table 3.13-11 Federally Managed Special Recreation Management Areas within Region II Analysis Area

Managing Entity	Recreation Site/Area[1]	Description
BLM Moab FO, Utah	Utah Rims SRMA	15,424 acres. Managed as a Community SRMA to provide sustainable opportunities for motorized, mechanized, and non-motorized route-related recreation while protecting and maintaining other resource values. Includes the Bitter Creek campsite.
	Labyrinth Rims/Gemini Bridges SRMA	300,650 acres. Managed as a Destination SRMA to provide opportunities for boating, camping, mountain biking, OHV and jeep use, and scenic driving.
BLM Vernal FO, Utah	Fantasy Canyon SRMA	69 acres. Provides opportunities for self-guided touring and hiking around unique geological formations.
	Nine Mile Canyon SRMA	44,168 acres. Managed to protect high-value cultural values and scenic quality and provide cultural tourism opportunities within the canyon, which has the greatest abundance of well-preserved rock art in the west and is often referred to as the "world's longest art gallery."
BLM Price FO, Utah	San Rafael Swell SRMA	938,500 acres. Provides opportunities for sightseeing, OHV use, mountain biking, horseback riding, hiking, wildlife viewing, visiting cultural sites, camping, picnicking, photography, rock hounding, snowmobiling, and hunting.
	Labyrinth Canyon SRMA	34,240 acres. Managed to provide flatwater river recreation, camping, hiking, and rock art viewing opportunities.
BLM Fillmore FO, Utah	Little Sahara RA	60,000 acres. Area provides sand dune OHV riding and camping opportunities. The entire RA is open to OHV use except for campgrounds, where OHV use is limited to designated roads, and within the 9,604-acre Rockwell Natural Area, which is closed to OHVs.

[1]Within each BLM FO, other specially designated areas, such as WSAs, WSRs, wilderness areas, or ACECs have recreational use, but are not designated specifically for recreational use. These other areas are analyzed in Section 3.15, Special Designations.

Sources: BLM 2012d,e,f,g,h,i,j,k; 2008b,c,d,e; 1997b; 1990; 1987a,b,c.

Table 3.13-12 State Managed and Locally Managed Recreation Areas within Region II Analysis Area

Managing Entity	Management Area	Description
Utah Division of State Parks and Recreation	Starvation State Park and Reservoir	State Park includes the reservoir and developed campground area. Boating, water skiing, wake boarding, and other sports are popular at Starvation Reservoir. The reservoir offers sandy beaches and fishing for walleye, trout, and perch.
UDWR	Gordon Creek WMA	22,690 acres (11,100 DWR, 6,900 BLM, 3,000 SITLA, and 1,690 private). Developed to assure protection of critical big game winter range. Reversionary clause on some parcels if land use changed from "big game management."
	North Nebo WMA—Fountain Green Unit	Three subunits: Fountain Green (365 acres), Moroni Conservation Easement (1,110 acres), and Big Hollow (850 acres). All units protect big game winter range; the Fountain Green unit is managed to reduce crop depredation on adjacent farms and improve upland game habitat. The property is closed to public access in winter and spring to protect wintering wildlife; the Fountain Green unit farm road is closed all year. Already crossed by power line(s). The Moroni Conservation Easement was purchased under three transactions, so there are three parts to the Conservation Agreement. The July 1997 agreement (#2-5249) states in Section B.2. Development Rights: Grantors convey to Grantee the rights to all . . . industrial, commercial or any other forms of development that could be construed as inconsistent with the wildlife-habitat protection purpose of this Deed of Conservation Easement. Also in D.2. Easements and ROW: Without prior written approval of Grantee (UDWR), no rights-of-way or easements may be issued on the above-described property. In Parts II and III, section B.2. the Grantor conveyed the same development rights to the Grantee and the same terms and conditions for easements and ROWs as in the 1997 agreement.
	Currant Creek/Wildcat WMA	22,857 acres. Acquired as mitigation for wildlife habitat lost during construction of Central Utah Project (CUP) water developments. The property also provides angler access and aquatic/terrestrial habitat protection. Vehicle use during winter is not encouraged; motorized vehicles not allowed off remaining roads.
	Northwest Manti WMA–Dairy Fork Unit	4,975 acres. Unit acquired to preserve and enhance deer and elk winter range. Closed to public access in winter and spring to protect wintering wildlife. The WMA contains existing power lines.
	Northwest Manti WMA–Birdseye/Lake Fork Unit	3,750 acres. Unit acquired to preserve big game winter range. Closed to public access in winter and spring to protect wintering wildlife. The WMA contains existing power lines.
	Nephi WMA–Nephi Unit	152 acres. Unit supports riparian habitat and patches of emergent marsh along West Creek. Upland game hunting opportunities are available. Vehicles are not permitted on the property.
	Fillmore WMA	Several separate parcels covering 13,100 acres. Area managed to provide protection for big game winter range. All lands are fenced; vehicles are restricted to established roads. Closed to public access in winter and spring to protect wintering wildlife.
	Indian Canyon WMA – Cottonwood Canyon Unit	7,746 acres. Area provides opportunities to view elk, antelope, and small numbers of deer. Cottontail rabbit hunting is a popular wintertime activity in the Cottonwood Canyon area. Some roads are closed; motorized vehicles are not allowed off remaining roads. Vehicle use in winter is not encouraged.
	Tabby Mountain WMA–Rabbit Gulch Unit	Two parcels of 8,247 and 1,160 acres. Unit acts as critical range for big game in winter. Closed to public access in winter and spring to protect wintering wildlife. Vehicle use is confined to established roads.
	Tabby Mountain WMA–Tabby Mountain Unit	42,025 acres. Unit acts as critical range for big game in winter. Closed to public access in winter and spring to protect wintering wildlife. Vehicle use is confined to established roads. This WMA is adjoined by a conservation easement (Sand Wash/Sink Draw) that prohibits overhead transmission lines.
	North Nebo WMA–Spencer Fork Unit	6,500 acres. Unit acquired to protect big game winter range. Closed to all access in late winter and spring to protect wintering wildlife. Vehicle use is confined to established roads. Contains existing power line(s). Section B.2.a. of the 1999 Deed of Conservation Agreement (DCA) (#73398) states that the "Grantor conveys …industrial, commercial and any other forms of development that would be construed as inconsistent with the conservation values and purpose of the Easement . . . ." Section C.3. of the DCA states that: "Without prior written approval of Grantee, no rights-of-way or easement may be issued on the above described property."
	South Nebo WMA–Triangle Ranch Unit	4,918 acres. Unit managed to protect big game winter range. Closed to public access in winter and spring to protect wintering wildlife. Already crossed by power line(s). Reversionary clause on some parcels if land use changed from "big game management."

Table 3.13-12 State Managed and Locally Managed Recreation Areas within Region II Analysis Area

Managing Entity	Management Area	Description
UDWR (Continued)	Strawberry River WMA	3,070 acres. Area is mitigation for the CUP and provides unique fishing and wildlife viewing opportunities. Area contains big game and predator habitat. Vehicles are restricted to the main road and immediate parking areas. In accordance with the Mitigation Commission's and Bureau of Reclamation's management plan for the Strawberry River WMA, the middle Strawberry River from Soldier Creek Dam to about 1 mile upstream of Strawberry Pinnacles is one of the few remaining undeveloped riparian ecosystems in the region. The primary management objectives on this section of the middle Strawberry River are to provide the highest level of protection to the biological productivity and diversity of the riparian and aquatic ecosystem and to provide angling opportunities.
	Emery Farm Castle Dale WMA	80-acre farm comprised of salt-grass pasture and Russian olive trees. The property was obtained when the Emery County power plants were built to offer upland game habitat protection.
	Northwest Manti WMA–Hilltop Conservation Easement	1,074 acres. Unit includes juniper/pinyon woodlands interspersed with openings dominated by oakbrush or big sagebrush. The unit was acquired to protect and enhance high-value mule deer winter range. Closed to public access in winter and spring to protect wintering wildlife. Deed of Conservation Easement, Section V-Prohibited Uses and Practices, G. Construction (grantors will not construct any structures or facilities on the property. . .); H. Roads (grantors will not construct any new roads except as specifically provided for in Section III. . .), L. Utilities (additional utility structures and systems are prohibited, unless such structures or systems are necessary for permitted ranching operations or residential use. . .)
	Northwest Manti WMA–Lasson Draw Unit	2,225 acres. Unit acquired to protect big game winter range. Comprised of a sagebrush/grass community in the valley and a pinyon juniper woodland/oakbrush community on the steeper slopes. Big game hunting and deer and elk viewing opportunities are provided. Property is closed to all access in late winter and spring to protect wintering wildlife. Motor vehicle use restrictions are enforced on the unit. Already crossed by buried pipeline; Questar pipeline maintenance road is not a public access road.
	Northwest Manti WMA–Starvation Unit	5,770 acres. Unit provides big game hunting opportunities and is a popular use of the property. Starvation Creek supports a limited fishery that receives a fair amount of fishing pressure. The unit was acquired to protect and enhance deer and elk winter range. The property is closed to public access in winter and spring to protect wintering wildlife. Already crossed by power line(s).
Private/UDWR	CWMUs	Antelope Creek (31,853 acres), Bear Mountain (8,037 acres), Castle Valley Outdoors (10,558 acres), Crab Creek (10,409 acres), Double R Ranch (6,390 acres), Emma Park (22,471 acres), Hiawatha (15,355 acres), Johnson Mountain Ranch (13,330 acres), Minnie Maud Ridge (16,030 acres), Oak Ranch (4,670 acres), Old Woman Plateau (8,165 acres), Round Valley (7,976 acres), Scofield Canyons (15,658 acres), Soldier Summit (26,127 acres).
Emery County	Bear Creek Campground	Located 8 miles up Huntington Canyon, the campground provides 29 campsites and 2 pavilions.
Private	Big Mountain Campground	Located 5 miles east of Nephi, Utah, the campground provides RV camping, fishing, and camping amenities at the base of the Nebo Loop Scenic Byway.
Ouray Park Irrigation Company	Brough Reservoir	Blue ribbon trophy trout fishing.
Uintah and Ouray Indian Reservation	Bottle Hollow Reservoir	Used for fishing.
Western Rio Blanco Metropolitan Recreation and Park District	Cedar Ridges Golf Course	Par 36, 9 hole public golf course near Rangely, Colorado.
Church of Jesus Christ of Latter Day Saints	Camp Timberlane	The camp consists of 720 acres of forest land at the top of Argyle Canyon. The camp consists of 4 major campgrounds, a summer home for the Camp Manager, a smaller campground, a family size "A" frame and 2 individual campsites. The camp is generally available from early June to Labor Day. Several hiking trails also are available.

Source: Big Mountain Campground 2013; Camptimberland.org 2013a,b; Emery County 2013; UDWR 2002; Western Rio Blanco Metropolitan Recreation and Park District 2013.

3.13.5.3 Region III

The BLM is the main federal agency providing recreation opportunities in this region. Five BLM Field Offices provide recreation areas within the analysis area that contain few to no developed facilities. Despite the lack of facilities, there are many recreation opportunities available on lands within the region, including hiking, camping, rock climbing, horseback riding, hunting, OHV use, scenic driving, fishing, mountain biking, and competitive OHV events. In addition, there are recreation opportunities available on NFS lands on the Dixie National Forest and USFWS lands on the Desert NWR; the NWR is discussed in Section 3.15, Special Designation Areas. There is one private recreation site within the region, Newcastle Reservoir. A brief description of dispersed recreation opportunities by BLM FO and national forest within the Region III analysis area is included in **Table 3.13-13**. **Table 3.13-14** identifies Scenic Byways and Backways within the Region III analysis area. **Table 3.13-15** identifies all federally managed special recreation management areas and **Table 3.13-16** identifies all state and locally managed recreation areas within the Region III analysis area. **Figure 3.13-4** identifies all recreation areas within the Region III analysis area.

Table 3.13-13 Forest Service-Managed Recreation Opportunities within Region III Analysis Area

Managing Entity	Key Dispersed Recreation Activities within Analysis Area
Fillmore FO, Utah	4.7 million acres of BLM-managed public lands located on the eastern edge of the Basin and Range Geographic Province. Portions of the FO are in both Region II and Region III. Dispersed recreation opportunities within the Region III portions of the FO include hunting, fishing, hiking, rock hounding, and OHV use. The FO also contains several state-managed WMAs. Cultural tourism sites include the Dominquez-Escalante trail. The 129-mile Cricket Mountains ATV loop trail system is located within the analysis area.
Cedar City FO, Utah	2.2 million acres of BLM-managed public lands. The FO area is characterized by vast acres of sagebrush and pinyon-juniper clad foothills, home to greater sage grouse, the Utah prairie dog, the Southwest Desert Elk Herd, and the Sulphur Wild Horse Herd - a breed of horse noted by its distinct markings and Spanish genetics. Dispersed recreation opportunities within the FO include primitive camping, hiking, horseback riding, OHV use, bird watching, rock hounding, mountain biking, nature study, and photography. Cultural tourism sites include the Dominquez-Escalante trail. The analysis area also contains portions of the American Discovery Trail, a system of 6,800 miles of recreational trails and roads that collectively form a coast-to-coast hiking and biking trail across the U.S.
St George FO, Utah	635,000 acres of BLM-managed public lands. Located at the merge point of the Mojave Desert, the Great Basin, and the Colorado Plateau ecosystem, these public lands are a rich mix of geologic formations, biological habitats, scenic landscapes, and cultural history. Recreation activities range from casual sightseeing and hiking to more physically demanding activities such as mountain biking, ATV riding, rock climbing, horseback riding, and canyoneering. Other activities include geocaching and cultural tourism (including the Dominquez-Escalante and Old Spanish trails).
Caliente FO, Nevada	4.2 million acres of BLM-managed public lands. Much of the FO area is representative of the Great Basin with large expanses of rolling sagebrush and grasses. Recreation opportunities include hunting (pronghorn, mule deer, elk), hiking, biking, horseback riding, camping, OHV use, and rock hounding. The analysis area includes portions of the Silver State OHV trail, a 260-mile congressionally designated OHV trail and BLM Backcountry Byway; there are several trailheads in and near the town of Caliente. The Chief Mountain area is frequently used for OHV riding and includes three developed trailheads, 413 miles of roads, OHV routes and trails, including 39 miles of the Silver State Trail. The Oak Springs Summit Trilobite Area is located 12 miles west of Caliente. Areas of the FO within the analysis area include portions of the Chief Mountain and North Delamar SRMAs. The analysis area includes portions of the Highway 93 Scenic Byway and Rainbow Canyon Backcountry Byway.
Las Vegas FO, Nevada	2.4 million acres of BLM-managed public lands, portions of which are included in both Region III and Region IV. Dispersed recreation opportunities within the Region III analysis area include hunting, camping, and OHV use. The FO permits a number of commercial and competitive high speed desert events. Other recreation opportunities within the analysis area include rock climbing in Arrow Canyon and recreational driving along the Bitter Springs Backcountry Byway.

Table 3.13-13 Forest Service-Managed Recreation Opportunities within Region III Analysis Area

<table>
<tr><th>Managing Entity</th><th>Key Dispersed Recreation Activities within Analysis Area</th></tr>
<tr><td>Dixie National Forest</td><td>1.7 million acres of USFS-managed public lands. The analysis area includes portions of the Pine Valley Ranger District. Recreational opportunities are highly diversified and include camping, hunting, viewing scenery, hiking, horseback riding, and fishing in both primitive settings and developed areas. Vehicle-based activities include camping, picnicking, hunting, gathering forest products, viewing interpretive exhibits, viewing scenery, snowmobiling, and biking. Developed recreation opportunities within the analysis area include the Mountain Meadows Massacre Site and the Ox Valley ATV Trail. Considered as a whole, the Dixie National Forest contains the following acreage by ROS class:
<table>
<tr><td>Urban</td><td>N/A</td><td>0%</td></tr>
<tr><td>Rural</td><td>N/A</td><td>0%</td></tr>
<tr><td>Roaded Modified</td><td>N/A</td><td>0%</td></tr>
<tr><td>Roaded Natural</td><td>54,848 acres</td><td>3%</td></tr>
<tr><td>Semi-primitive Motorized</td><td>115,513 acres</td><td>7%</td></tr>
<tr><td>Semi-primitive Non-motorized</td><td>225,221 acres</td><td>13%</td></tr>
<tr><td>Primitive</td><td>67,292 acres</td><td>4%</td></tr>
<tr><td>Non-inventoried, unknown, or private</td><td>1,248,423 acres</td><td>73%</td></tr>
<tr><td>TOTAL</td><td>1,711,297 acres</td><td>100%</td></tr>
</table>
The analysis area includes acreage within roaded natural, semi-primitive motorized, and semi-primitive non-motorized ROS classes.</td></tr>
</table>

Sources: BLM 2012k,l,m,n,o; 2008f; 1998; 1997c; 1987a,b; 1986; Great Basin Institute 2012; Millard County 2012a,b; USFS 2012f, 1986c.

Table 3.13-14 Scenic Byways and BLM Backways within Region III Analysis Area

Name	Length/Designation	Description
Highway 93 Scenic Byway	148.8-mile Nevada State Scenic Byway between the town of Crystal and the Humboldt-Toiyabe National Forest on Highway 93 in eastern Nevada	Route provides high desert scenery with views of Mount Gafton, Dutch John Peak, and the Wilson Creek Range. Roadway passes through Pioche, an early 20th century mining camp filled with historic buildings.
Rainbow Canyon Backcountry Byway	21-mile BLM Backcountry Byway	Route provides views of Rainbow Canyon, a deep canyon full of red rock and unique rock formations. The road closely follows the busy Union Pacific Railroad.
Bitter Springs Backcountry Byway	28-mile BLM Backcountry Byway	Scenic drive with many rock formations, like the Muddy Mountains, and colorful sandstone for sightseeing. Byway features include abandoned borax mines.
Silver State OHV Trail	260-mile BLM Backcountry Byway	OHV trail network offering access to the rugged, scenic, and remote deserts and mountains of eastern Nevada. The trail system can be accessed from Panaca, Pioche, and Caliente. There are five main trailheads to access the Silver State Trail; Patterson, Pahroc Wash, Stampede, Chief Mountain South, and Chief Mountain West.

Sources: BLM 2012n, 2008f, 1998, 1997c, 1987a,b, 1986; Exploring Nevada.com 2012; Great Basin Institute 2012; USDOT 2012.

Table 3.13-15 Federally Managed Special Recreation Management Areas within Region III Analysis Area

Managing Entity	Recreation Site/Area[1]	Description
Caliente FO, Nevada	Chief Mountain SRMA	111,181 acres. Recreation opportunities include rock hounding, trilobite collecting, camping, hunting, and both event-organized and casual OHV riding. The SRMA contains 413 miles of roads, OHV routes, and trails. The Chief Mountain SRMA is crossed by 38.7 miles of the Silver State Trail. Both the West and South Chief Mountain trailheads provide access to this trail. The SRMA contains two trilobite collection areas.

Table 3.13-15 Federally Managed Special Recreation Management Areas within Region III Analysis Area

Managing Entity	Recreation Site/Area[1]	Description
Caliente FO, Nevada (Continued)	North Delamar SRMA	202,890 acres. Managed for a broad spectrum of recreation opportunities to ensure a balance of recreation experiences. A wide range of activities occur within the SRMA including backcountry driving, hunting, OHV use, competitive racing, heritage tourism, and hiking.
Las Vegas FO, Nevada	Muddy Mountains SRMA	123,400 acres. Managed to provide integrated management of wildlife habitat, cultural resources, and recreational uses. 78,480 acres managed as a semi-primitive non-motorized area; 44,897 acres managed as a semi-primitive motorized area.
	Nellis Dunes SRMA	10,000 acres. Managed as an open area for intensive OHV and other recreation opportunities, including organized OHV events, casual OHV freeplay, picnicking, photography, and other non-OHV commercial and competitive permitted activities. Portions of this SRMA are within Region III and IV.

[1]Within each BLM FO, other specially designated areas, such as WSAs, WSRs, wilderness areas, or ACECs have recreational use, but are not designated specifically for recreational use. These other areas are analyzed in Section 3.15, Special Designations.

Sources: BLM 2012k,l,m,n,o; 2008f; 1998; 1997c; 1987a,b; 1986.

Table 3.13-16 State and Locally Managed Recreation Areas within Region III Analysis Area

Managing Entity	Management Area	Description
Private/UDWR	CWMUs	Zane (9,779 acres)
Newcastle Irrigation Company	Newcastle Reservoir	The Newcastle Irrigation Company owns the reservoir and presently provides unrestricted public access to the shoreline for fishing.

Sources: UDEQ 2011.

3.13.5.4 Region IV

Recreation opportunities in this region are primarily provided by the BLM and NPS. Several BLM areas provide opportunities for scenic driving, OHV use, and trail use. NPS provides developed recreation opportunities at two campgrounds in the Lake Mead NRA, in addition to trail use opportunities on the River Mountains Loop Trail and on backcountry roads. Region IV also includes a county wetlands park, a city park renowned for its mountain biking trails, and a private golf course.

Currently, there are no National Scenic Byways or BLM-designated Scenic Byways or Backways within Region IV. The Nevada Commission on Tourism currently is facilitating the nomination of Lakeshore and Northshore Roads within Lake Mead NRA for State Scenic Byway status. The nomination is primarily honoring the scenic, cultural, and natural features found along these road corridors.

A brief description of recreation opportunities on federally managed lands is included in **Table 3.13-17**. **Table 3.13-18** identifies all federally managed special recreation management areas within the Region IV analysis area, and **Table 3.13-19** identifies all state, local, or privately managed recreation areas within the Region IV analysis area. **Figure 3.13-5** identifies all recreation areas within the Region IV analysis area.

Table 3.13-17 Federally Managed Recreation Opportunities within Region IV Analysis Area

Managing Entity	Key Recreation Activities within Analysis Area
Las Vegas FO, Nevada	2.4 million acres of BLM-managed lands, portions of which are included in both Region III and Region IV. Dispersed recreation opportunities within the Region IV analysis area include the River Mountains Loop Trail, a 32-mile loop trail circling the River Mountains and linking residential areas to local and regional parks, including Bootleg Canyon to the south and Lake Mead NRA to the east. Camping is dispersed outside of the Red Rock NCA and not allowed within Las Vegas Valley, which includes areas west of the Lake Mead NRA including the northern portion of Sloan Canyon NCA, Las Vegas Valley SRMA, Nellis Dunes SRMA, and the western portion of the Muddy Mountains wilderness area/SRMA. These same areas are generally closed to OHV use, with the exception of Nellis Dunes, which is a popular OHV open use area. The Eldorado Valley, Nelson Hills and Jean/ Dry Lake areas are also popular OHV use areas.
NPS Lake Mead NRA	The NRA contains 1,482,476 acres of federal land and 28,212 acres of nonfederal land. Lake Mead NRA offers year-round recreational opportunities for boating, fishing, hiking, photography, picnicking and sightseeing. A portion of the Boulder Basin Zone of the NRA is within and adjacent to the analysis area. The majority of visitors to this zone are day users; overnight accommodations are limited. There are two developed areas: • Las Vegas Bay is the closest area to Las Vegas and therefore attracts a large number of day use visitors; includes camping and picnicking facilities. • Boulder Harbor/Beach is the largest and most heavily visited development in the recreation area; offers camping, picnicking, RV hookups, and boat launch and harbor areas. The area also contains several trails including a bluffs trail, wetlands trail, a historic railroad trail, and a portion of the River Mountains Loop Trail. The area also offers recreational driving opportunities along Lakeshore Drive.
BLM Sloan Canyon NCA	48,000 acres. Managed to conserve, protect, and enhance the cultural, archaeological, natural, wilderness, scientific, geological, historical, biological, wildlife, educational, and scenic resources of this area. The area features important archaeological sites, scenic vistas, important wildlife habitat, and opportunities for primitive recreation. The northern end of the NCA is designated as a roaded natural area and contains a system of hiking and biking trails. The southeast portion is managed for semi-primitive non-motorized recreation. The western portions contain the North McCullough wilderness areas and are managed for primitive recreation.

Sources: BLM 2012o,p, 2006, 1998; City of Henderson 2012; NPS 1987, 2012.

Table 3.13-18 Federally Managed Special Recreation Management Areas within Region IV Analysis Area

Managing Entity	Name	Description
Las Vegas FO, Nevada	Nelson/Eldorado SRMA	81,600 acres. Offers competitive OHV events in accordance with desert tortoise protection requirements, including up to nine speed events scheduled only between November 1 and February 28 if within critical tortoise habitat.
Las Vegas FO, Nevada	Sunrise Mountain SRMA	37,620 acres. Offers recreation opportunities in concert with sensitive plant, scenic, cultural, and geologic values of the concurrent ACEC. Recreation opportunities include non-speed motorized and mechanized activities on designated roads.
Las Vegas FO, Nevada	Las Vegas Valley SRMA	197,300 acres. Designated to facilitate the provision of open space areas, recreational trails, and parks necessary for valley residents in coordination with county and city governments.
Las Vegas FO, Nevada	Nellis Dunes SRMA	10,000 acres. Managed as an open area for intensive OHV and other recreation opportunities, including organized OHV events, casual OHV freeplay, picnicking, photography, and other non-OHV commercial and competitive permitted activities. Portions of this SRMA are within Region III and IV.

Sources: BLM 2012o, 1998.

Table 3.13-19 State- and Locally Managed Recreation Areas within Region IV Analysis Area

Managing Entity	Name	Description
Clark County	Clark County Wetlands Park	2,900 acre nature and wildlife habitat viewing area bordering both sides of the Las Vegas Wash between Frenchman Mountain and Lake Mead. The park features a 100-acre nature preserve area with an information center, concrete walking trails, and graveled secondary trails. The park offers hiking, equestrian, and mountain biking opportunities.
Boulder City Parks and Recreation Department	Bootleg Canyon	Contains miles of popular mountain bike trails of varying degrees of difficulty and a commercial zipline operation.
Private	Cascata Golf Course	Privately owned par-72 luxury golf course featuring lush fairways, lakes, and streams surrounded by canyons. Rated #1 in the country by Zagat Survey in 2008.

Sources: bootlegcanyon.net. 2012; Cascatagolf.com 2012; Clark County 2012; flightlinezboootlegcanyon.com 2012.

3.13.6 Impacts to Recreation

The NEPA scoping process revealed the public's concerns with impacts to recreation at specific locations, increases in traffic from construction, and the effects of noise and the "humming" sound from transmission lines on recreation users. Comments also were received related to the future use of access roads; comments were received that advocated for public use of access roads, as well as designing access roads to minimize unpermitted off-road vehicle use.

This section analyzes the impacts that construction, and operation, maintenance and decommissioning of the transmission line would have on recreational resources and opportunities, as well as recreational expectations and the likelihood for user satisfaction throughout the analysis area. *Recreational resources* are defined as the natural elements within the environment that provide the physical basis for recreation. *Recreational opportunities* are defined as the combination of the natural elements (e.g., scenery, vegetation, geology, land forms, weather) and human-controlled conditions (e.g., roads and trails, developed sites, facilities) that create the potential for recreation and may include dispersed or specially managed opportunities. *Recreational expectations* are those assumptions made by the user that, having prepared for the desired recreational experience and having entered the area of opportunity, he/she would have that expected experience (e.g., the natural sights and sounds of an undeveloped landscape while hiking or during a river rafting trip, a scenic drive through high quality scenery, or a hunting trip into areas with high quality wildlife habitat). It is important to note that achieving recreational expectations are not guaranteed regardless of the presence of the resource and the opportunity; unforeseen and/or changing conditions that are beyond the control of the managing entity or the user can influence and partially determine the user experience. *User satisfaction* can be defined as that subjective evaluation of the recreation activity in which the resource user recognizes that his/her recreational experiences meet or exceed his/her recreational expectations.

While recognizing that recreation resource users are individuals with uniquely personal expectations, goals, and levels of recreational satisfaction, it was assumed for the purposes of impact analysis that:

1. Recreation users within the analysis area could be classified into general user groups based on their primary recreation activity, each of which has its own set of recreational opportunities and expectations; and
2. Based on these opportunities and expectations, each group also has specific recreational conditions and criteria that increase the likelihood for having satisfying user experiences.

The following sections outline key recreation user groups that exist within the analysis area. Each user group description identifies the types of recreational opportunities and expectations associated with

each group, and in general, types of construction and operation impacts that would impact those opportunities and expectations.

3.13.6.1 Scenic Drivers

This group primarily would include users of passenger cars and recreational vehicles (RVs) driving for pleasure while enjoying scenic attractions. Recreationists that also could be included in this group are recreational aircraft users that enjoy scenic views from above. Recreational opportunities include scenic highways and byways and other areas where scenic integrity can be accessed by roads. The desired recreational experience for this user group generally relies upon paved access to scenic attractions (with the ability to access turnoffs and/or temporary parking) and developed campsites. During construction, activities that would result in high traffic volumes, crowded or closed parking areas or turnoffs, or construction activities and fugitive dust directly along the route would adversely affect this user group, as would noise and visual disturbances within developed campsites. During operations, impacts to the scenic attraction that can be viewed from the paved viewpoints, day use areas, or within developed campsites would adversely affect this user group.

3.13.6.2 Hunters and Wildlife Viewers

This group would include those using BLM and NFS lands, state-managed wildlife management areas, or conservation easement areas for hunting of a variety of wildlife species, though generally big game or upland game avian species. The desired recreational experience for this user group generally relies upon unimpeded access during hunting seasons to key hunting areas, dispersed camping areas, and a generally natural-appearing environment containing sufficient wildlife habitat to support the species. During construction, activities that would remove wildlife habitat, or would cause access road or area closures or noise and human activity affecting wildlife during hunting seasons would adversely affect this user group. During operations, impacts are expected to be lower for this user group, with the exception of noise and activities from transmission line maintenance. Facilities and human activities could be present if they do not interfere with access, degrade or remove habitat, impede wildlife movement or cause avoidance behaviors, or otherwise interfere with potential for hunting success; however, wildlife photographers would be impacted by the presence of human structures.

3.13.6.3 Motorized (Off-highway) Drivers

This group would include users of off-road motorcycles, dune buggies, all-terrain vehicles (ATVs), 4-wheel drive vehicles, and other OHVs. Recreation opportunities would include all designated OHV use areas and trails. The desired recreational experience for this user group generally relies upon a somewhat natural-appearing environment with non-paved surfaces ranging from graded dirt roads to challenging routes with some evidence of human sights, sounds, and disturbances to remote, natural-appearing environments. The presence of construction activity and some presence of human-constructed structures are acceptable; however, road or trail closures during either construction or operation would adversely affect this user group. If new roads or routes were left open for use by the general public, this generally would be positive for this group due to additional OHV access.

3.13.6.4 Mountain Bikers

The desired recreational experience for this user group generally relies upon a relatively natural or natural appearing environment in which evidence of human disturbances, restrictions, and controls is present but not appearing to dominate the environment. Recreation opportunities would include all roads and trails where mechanized travel is permitted. During construction, trail or trailhead facility closures and noise or dust/vehicle emissions would have adverse impacts on this group's recreational experience. Operations are assumed to have few adverse impacts to this group, as long as trails are not permanently closed.

3.13.6.5 Non-mechanized Users

This group would include hikers, backpackers, and equestrians. The desired recreational experience of this group generally relies upon dispersed recreation opportunities within a natural-appearing environment with little evidence of disturbance. Such areas would include national recreation or scenic trails as well as other hiking trails developed by the managing entity for day or extended use. During construction, closure to trails, trailhead facilities, or camping areas, and visual impacts and noise or dust/vehicle emissions would have adverse impacts on this group's recreational experience. During operations, visual impacts from the transmission line that cannot be mitigated would adversely affect this user group. In addition, visual impacts from the maintenance of transmission line roads and routes also would adversely affect this user group.

3.13.6.6 Recreational Boaters and Anglers

This user group includes primarily people who recreate on non-motorized boats such as canoes, kayaks, and rafts. Recreational opportunities in the analysis area primarily consist of floating on the Yampa and Green rivers. The needs of this group are similar to those of the non-mechanized user group. In general, the desired recreational experience for this user group relies upon a natural-appearing environment that shows little evidence of human disturbances within the river corridor, other than at the river access points and designated primitive campsites. During construction, closures to access points, noise, dust/vehicle emissions, and visual disturbances along the river corridor would have adverse impacts on this group's recreational experience. During operations, visual impacts to the river corridor’s scenic quality would adversely affect this user group. The desired recreational experience for anglers would include many of these factors, but would rely more heavily on factors that lead to fishing success (i.e., access to key fishing areas, undisturbed waters, etc.), and less on undisturbed land vistas. Access point closures, noise or human activity along river corridors, or sedimentation affecting water quality or fish habitat would have adverse impacts on this group's recreational experience; therefore, impacts to this user group are expected to occur primarily during construction.

For each user group and within each Region, the analysis identifies the following:

- Impacts to resources that underlie recreational use (e.g., impacts to big game or big game habitat within WMAs or dispersed hunting areas);
- Temporary or permanent closures to existing recreational opportunities from construction or operation of the transmission line and facilities, including any permitted special events;
- Temporary or permanent access restrictions to recreational opportunities from construction or operation of the transmission line and facilities; and
- Changes to the recreation setting of recreational opportunities (noise, visual) that would not meet user expectations.

Effects were determined by assessing the location of Project facilities associated with each alternative in relation to existing recreation opportunity areas. This assessment was conducted by using maps of recreation facilities and use areas overlaid with maps showing the location of Project transmission lines and support facilities. The analysis area for recreation includes all recreation facilities and areas within the 2-mile transmission line corridor. Impacts were determined by reviewing recreation activities that take place within affected areas, including typical use periods, users, and activity requirements to determine potential impacts from both construction and operations on recreation facilities, recreation use, recreation users, and the recreation setting. Impacts are described for both dispersed recreation and recreation at developed sites. In addition to typical recreation activities affected, the acreages of affected dispersed recreation areas are included, as are acreages for affected ROS classes within national forests. Impacts to key user groups also are described, as are general impacts to the key

recreation seasons most affected by construction and maintenance activities. Especially noted are impacts to recreation activities or facilities for which displaced visitors cannot easily find a substitute.

Aesthetic effects identified in Section 3.12, Visual Resources, were used to evaluate adverse effects on the recreation setting, including degraded scenic vistas, or establishment of highly obtrusive features. Obtrusive noises, identified in Section 3.18, Public Health and Safety, were considered in relation to the location of recreation opportunities and uses to evaluate adverse effects to the recreation setting. Obtrusive noises, such as construction equipment movement, earthwork, tree removal, other short-term construction activities, and operational transmission line "buzzing" were considered in comparison to other existing noise sources on nearby recreational activities. Potential effects on wildlife or aquatic resources were determined using the findings presented in Sections 3.5, Vegetation; 3.6, Special Status Plant Species; 3.7, Wildlife Resources; 3.8, Special Status Wildlife Species; 3.9, Aquatic Resources; and 3.10, Special Status Aquatic Resources. Section 3.14, Land Use, and Section 3.16, Transportation and Access, provided the basis for addressing changes in land use and management or access to recreation opportunities.

3.13.6.7 Impacts from Terminal Construction and Operation

The northern and southern terminals would be constructed regardless of alternative route or design option. This section describes the impacts to recreation from terminal construction and operation.

Northern Terminal

The Northern Terminal would be located on private property southwest of Sinclair, Wyoming. There is no public use of the proposed Northern Terminal area for recreation and no known private recreation use occurs on or adjacent to the property. Land areas around the terminal area are used for dispersed recreation.

During construction, recreational uses in adjacent portions of the CDNST SRMA area closest to the Northern Terminal could be temporarily affected by noise and activity; however, there are no special management areas and no recreational use that could not occur on other public lands.

No impacts to recreation are anticipated from construction and operation of the proposed Northern Terminal because there is no public use or known recreation use occurring at the site.

Southern Terminal

The Southern Terminal would be located primarily on private property southwest of Boulder City, Nevada. Existing substations and energy facilities are located in the area. There is no public use of the private property within the proposed Southern Terminal area for recreation; however, there could be some unauthorized OHV use on private property due to OHV use on adjacent BLM lands. The Southern Terminal area includes three acres of the eastern edge of the Sloan Canyon NCA; the Southern Terminal Alternative would be located within this area. Impacts to the Sloan Canyon NCA are discussed in Section 3.15, Special Designations.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Because the implementation of Design Option 2 would utilize the same alternative routes and construction techniques as the Proposed Project, impacts from construction and operation of this design option would be similar to those discussed under the alternative routes. Differences between this design option and the Proposed Project include the locations of the southern converter station and ground electrode systems, as well as the addition of a series compensation station midway between the IPP and Marketplace. The southern converter station would be located near the IPP in Utah instead of at the Marketplace in Nevada and the ground electrode system would be within 50 miles of the IPP. Construction and operation of a converter station near IPP, and a series compensation station would not be expected to impact recreation resources beyond what is described for Project impacts.

Construction of the ground electrode site near the IPP would affect 112,569 acres of undesignated BLM lands available for dispersed recreation in the Fillmore FO. Please see Section 3.13.6.8 for general construction and operation impacts to dispersed recreation for a description of potential impacts to recreation from construction and operation of the Delta ground electrode site.

Design Option 3 – Phased Build-Out

Because the implementation of Design Option 3 would utilize the same alternative route, facilities, and construction techniques as the Proposed Project, impacts from construction and operation of this design option would be the same as those discussed under the alternative routes. The additional substation near the IPP needed for Design Option 3 would not be expected to impact recreation resources beyond what is described for Project impacts.

3.13.6.8 Impacts Common to all Alternative Routes and Associated Components

Construction and operation of all of the alternative routes in each analysis area region would entail impacts to undesignated, general BLM and NFS lands (i.e., the lands do not contain specific recreation facilities or activities, or are not designated for specific purposes). Undesignated BLM and NFS lands typically receive dispersed hunting, fishing, camping, and OHV use. In general, a large portion of the land managed by each BLM FO or national forest is undesignated. This section includes a description of the general impacts that power line construction, operations and maintenance, and decommissioning would have on dispersed recreation. Context and intensity would vary by alternative and would depend upon acreage losses (i.e., acreage encumbered with facilities) or used during construction, the specific user group, and landscape characteristics near the construction area. These issues are discussed in greater detail by region, FO, and national forest in Sections 3.13.6.9 to 3.13.6.12. Impacts to designated recreational areas/sites or areas with known developed uses also are described by region, FO, and national forest in these sections. Any recreation-related BMPs within the relevant management plans, such as measures to protect the recreation viewshed or setting, would be required of the applicant to minimize impacts to recreation resources.

General Construction Impacts to Dispersed Recreation

During construction, noise or visual presence of construction activities could temporarily affect the experiences of visitors participating in dispersed recreation opportunities near the construction area (generally limited to those areas within the 2-mile transmission line corridor). Construction is expected to affect dispersed recreation use particularly on the weekends (Saturdays; there will be no construction on Sundays); seasons of use may vary by region and are discussed in Sections 3.13.6.9 to 3.13.6.12. The duration of transmission line construction activities on any given parcel of land may extend up to a year, although the total amount of time of actual construction activity would be much shorter, in the range of a few months. Over any particular section of the route, transmission line construction would be characterized by short periods (ranging from a day to 1 to 2 weeks) of relatively intense activity interspersed with periods of no activity.

Construction generally would result in vegetation (habitat) removal within the entire 250-foot-wide transmission line ROW. Roads and construction support areas would be built within the 2-mile transmission line corridor, resulting in additional surface disturbance. At peak construction levels, human activity would be high and noise would generally be above existing background levels within the entire width of the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety, for a discussion of noise); however, terrain and vegetation of the area could provide visual screening and noise attenuation. As discussed in Section 3.13.6, some user groups would be more affected by habitat removal, noise and visual disturbance than others; for example, hunters, wildlife viewers and mountain biker user groups, whose recreation experience is dependent upon quiet natural experiences or undisturbed wildlife would be more affected than OHV users or other activities for which vegetation removal, noise, and human activity does not affect the recreation experience. Section 3.13.6 provides a list of key user groups and assumptions related to changes in their

recreation experience from transmission line construction. In most cases, dispersed recreation opportunities are not limited to one particular locale and suitable substitute locations would exist nearby for the same dispersed recreational activities. Exceptions are described by region, FO, and national forest in Sections 3.13.6.9 to 3.13.6.12. Construction also could temporarily affect the ability of visitors to participate in dispersed recreation opportunities by limiting access. As noted in Section 3.16, Transportation and Access, Project construction would create short-term, minor and incidental increases in local traffic, but the construction phase is not expected to create substantial congestion for extended periods. Site specific access construction impacts are not provided in Section 3.16 at this stage due to the length of the corridors for each alternative; therefore, recreation site-specific access construction impacts are only discussed generally within this section. Road Access Plans will be developed for the Agency Preferred Alternative once it has been determined. Please see Section 3.16, Transportation and Access, for a description of the construction phase mitigation regarding the preparation of Road Access Plans and Construction Period Traffic Management Plans for the corridor as part of the COM Plan.

General Operation Impacts to Dispersed Recreation

Operations would result in permanent visual impacts to areas along the transmission line, including areas used for dispersed recreation. While these impacts would not appreciably affect the availability of the recreation resource used while engaging in dispersed recreational activities (i.e., big game or fish habitat), the setting in which they occur would be affected visually and some users may choose to recreate elsewhere. In general, suitable substitute locations would exist nearby for the same dispersed recreational activities. Exceptions are described by region, FO, and national forest in Sections 3.13.6.9 to 3.13.6.12.

Maintenance activities, particularly maintenance of access roads and vegetation management could affect access to recreation sites/areas; however, any access impediments or delays from Project-related activities would be temporary. Maintenance activities and vegetation management also could temporarily affect the ability of some user groups to participate in certain recreation opportunities (e.g., hunting, wildlife viewing) or affect the recreation experiences of visitors adjacent to maintenance work sites due to noise from maintenance activities. Transmission line maintenance activities are expected to occur infrequently; the frequency and type of vegetation maintenance activities would vary by area but could involve annual maintenance programs. Maintenance-related noise could temporarily affect adjacent hunting, fishing, and wildlife viewing opportunities by making the area less hospitable for wildlife or fish. In addition, maintenance-related noise also could temporarily affect adjacent opportunities for solitude or viewing scenery. Annual ground inspections would likely not result in any impacts to recreation opportunities or experiences. Semi-annual aerial inspections (passing helicopters) could result in temporary noise effects to the ambient recreation setting of any adjacent or nearby recreation site/area. Section 3.13.6 provides a list of key user groups and assumptions related to changes in their recreation experience from transmission line operation.

Project access roads would be evaluated on a case-by-case basis by the appropriate federal or state land manager to determine whether to close roads to the public, close and reclaim roads, or leave roads open as part of the transportation network. Roads to be closed to the public would have signage indicating the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Despite the presence of closure signs, closed roads may become an attractive nuisance and lead to unauthorized OHV use and associated resource damage, noise, etc. Other deterrents such as barriers, contouring, and revegetation may be used to indicate closed roads as determined on a site-specific basis depending on site-specific needs, management requirements, and reasonable application of the treatment. The proponents would monitor permanent roads on NFS land and BLM-administered lands yearly, and the applicable land-managing agency will be provided with annual monitoring reports. If TWE-maintained access roads remain available for public use, continued maintenance of these roads would be a beneficial impact for those recreationists seeking motorized recreational opportunities and increased access in the area; conversely, such roads

could adversely impact recreational opportunities for solitude or non-motorized recreational experiences.

General Decommission Impacts to Dispersed Recreation

At the end of the project's 50-year ROW grant, or when it is determined that the project is no longer economical, the project would be decommissioned and the area reclaimed. During decommissioning, the level of effort, equipment needed, and phasing to decommission the transmission lines and support facilities would be similar to constructing the facilities. Chapter 2 and **Appendix D** contain information regarding the preparation of Reclamation Plans.

3.13.6.9 Region I

Table 3.13-20 provides a summary of Region I recreation areas/sites by alternative, both within the 250-foot-wide transmission line ROW and within the 2-mile transmission line corridor.

Table 3.13-20 Region I Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area/Site	Alternative I-A 250-foot-wide ROW 2-mile Corridor Acres (% of total area)	Alternative I-B 250-foot-wide ROW 2-mile Corridor Acres (% of total area)	Alternative I-C 250-foot-wide ROW 2-mile Corridor Acres (% of total area)	Alternative I-D 250-foot-wide ROW 2-mile Corridor Acres (% of total area)
BLM Rawlins FO				
Dispersed, undesignated recreation areas	1,764 (0.05) 78,251 (2.2)	1,847 (0.08) 76,336 (2.2)	1,350 (0.04) 58,224 (1.7)	2,297 (0.06) 94,929 (2.7)
CDNST SRMA	4 (0.1) 1.4 miles/179 (29.8)	4 (0.1) 1.4 miles/179 (29.8)	4 (0.1) 1.4 miles/179 (29.8)	4 (0.1) 1.4 miles/179 (29.8)
Adobe Town DRUA	N/A	101 (0.04) 4,420 (1.8)	N/A	N/A
BLM Little Snake FO				
Dispersed undesignated recreation areas	1,328 (0.1) 51,779 (4.1)	1,217 (0.09) 63,149 (5.0)	770 (0.06) 28,629 (2.3)	1,217 (0.09) 63,149 (5.0)
South Sand Wash SRMA	N/A	N/A	N/A	N/A
Juniper Mountain SRMA	N/A	N/A	40 (2.2) 1,437 (80.7)	N/A
Serviceberry SRMA	N/A	N/A	0 1,462 (11.8)	N/A
Little Yampa Canyon SRMA	N/A	N/A	0 <1 acre (0)	N/A
BLM White River FO				
Dispersed, undesignated recreation areas	373 (0.03) 13,799 (0.9)	373 (0.03) 13,799 (0.9)	373 (0.03) 13,799 (0.9)	373 (0.03) 13,799 (0.9)
Other Federal Recreation Areas				
Dinosaur National Monument	N/A	N/A	N/A	0 16 (<0.01)
State Recreation Areas				
Wyoming				
Red Rim-Daley WHMA	58 (0.2) 2,847 (11.3)	58 (0.2) 2,847 (11.3)	58 (0.2) 2,847 (11.3)	58 (0.2) 2,847 (11.3)

Table 3.13-20 Region I Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area/Site	Alternative I-A 250-foot-wide ROW 2-mile Corridor Acres (% of total area)	Alternative I-B 250-foot-wide ROW 2-mile Corridor Acres (% of total area)	Alternative I-C 250-foot-wide ROW 2-mile Corridor Acres (% of total area)	Alternative I-D 250-foot-wide ROW 2-mile Corridor Acres (% of total area)
Upper Muddy Creek Watershed/Grizzly WHMA	N/A	N/A	19 (0.3) 1,015 (1.7)	N/A
Colorado				
Yampa River SWA	N/A	N/A	0 199 (23.1)	N/A
Bitter Brush SWA	N/A	N/A	107 (1.3) 4,921 (61.1)	N/A
Raftopolous Hunting Lease	0 617 (5.4)	N/A	N/A	N/A
Yampa River State Park	1 river crossing; 1 access point	1 river crossing; 0 access points	3 river crossings; 4 access points	1 river crossing; 0 access points
Local Recreation Areas				
Juniper Hot Springs	N/A	N/A	0 Entire site	N/A

Alternative I-A (Applicant Proposed)

Alternative I-A would cross dispersed recreation areas in three FOs, one specially managed recreation area, one wildlife area in Wyoming and one in Colorado. Alternative I-A also would affect one Yampa River access point and cross the river once.

BLM Dispersed Recreation Areas

General construction impacts to dispersed recreation activities are described in Section 3.13.6.8 and would affect recreationists by displacing visitors due to area closures, noise or visual presence of construction, or making the area inhospitable for wildlife. Within Region I, the 250-foot-wide transmission line ROW for Alternative I-A would impact 1,764 acres of dispersed recreation area in the Rawlins FO, 1,328 acres within the Little Snake FO, and 373 acres within the White River FO during construction. The 2-mile transmission line corridor for Alternative I-A, would encompass approximately 78,251 acres of dispersed recreation area in the Rawlins FO; 51,779 acres within the Little Snake FO; and 13,799 acres within the White River FO during construction. This is 2.2 percent, 4.1 percent, and less than 1 percent, respectively, of total available acreage for dispersed recreation in each FO and represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. These impacts would be greatest to the hunters and wildlife viewer user group due to the direct loss of habitat, and to non-mechanized users such as hikers or backpackers, due to aesthetic impacts that would make recreation experiences in those areas undesirable. It also is important to note that construction is sequential; therefore, not all acreage within the 2-mile transmission line would be subject to noise and human activity at the same time.

Recreation use in Region I would be affected most during the summer, when general recreation use peaks in this area, and during the fall and winter (generally September to February), when most big game hunting occurs. There are no high use areas identified within the Rawlins or White River FOs that would be near or within the 2-mile transmission line corridor. Within the Little Snake FO,

Alternative I-A would pass though important hunting areas west of Maybell. These areas would likely be lost to hunting during construction (see Section 3.8, Wildlife Resources for more information regarding avoidance behavior of big game from noise); however, the areas outside the 2-mile transmission line corridor, to which big game likely would be displaced, are federal lands that are open to hunting.

Within the Rawlins FO, Alternative I-A would cross Muddy Creek; within the Little Snake FO, the Alternative I-A would cross the Little Snake and Yampa rivers. There are no high recreational use areas or access points to Muddy Creek or the Little Snake River within the 2-mile transmission line corridor. Alternative I-A would cross the Yampa River near a high use access area west of Maybell (the East Cross Mountain access point). The access point would be within the 2-mile transmission line corridor, resulting in adverse impacts to recreational boaters or anglers on the river and campers at the access point due to the sounds and sights of construction. Impacts to the Yampa River are discussed in greater detail as part of the Yampa State Park analysis, below. Alternative I-A also would cross the Yampa Valley Trail west of Maybell. The trail is commonly used for mountain biking, horseback riding, hiking, wildlife viewing, and OHV use. However, use of the trail in this area is low; the more popular trail segment is in the Little Yampa Canyon SRMA (BLM 2010). Though construction activities could potentially degrade the recreation setting from construction noise and activities, only a small section of the trail would be temporarily affected and the majority of nearby trail mileage would not be affected. If visitors participate in recreation opportunities near the construction area (generally within the 2-mile transmission line corridor), recreation experiences for visitors could be temporarily degraded from construction noise and activities.

Operation of Alternative I-A would affect 1,764 acres of the 250-foot-wide transmission line ROW within the Rawlins FO; 1,328 acres within the Little Snake FO; and 373 acres within the White River FO. This represents <0.1 percent of each FO. Operation would have minimal impacts to most dispersed recreation experiences (see Section 2.14.6.2); however, the presence of a transmission line crossing the Yampa River would be a permanent adverse impact to the river recreation experience. Maintenance activities also could disrupt hunting and wildlife watching activities due to noise and human presence. Due to the importance of the area around Maybell for big game hunting, the following additional mitigation measure is recommended to reduce the potential for impacts to hunting:

***REC-1**: Where practicable, operation phase vegetation maintenance activities within dispersed recreation areas or key hunting locales would not occur during big game hunting seasons.*

Implementation of this measure would be highly effective in reducing impacts to hunting activities and also would be a beneficial impact to worker safety.

BLM SRMAs or Other Specially Managed Recreation Areas

<u>CDNST and SRMA</u>. On BLM lands within the Rawlins FO, approximately 1.4 miles of the CDNST would be included within the 2-mile transmission line corridor for Alternative I-A; the 250-foot-wide transmission line ROW would not include the CDNST on BLM lands. Approximately 0.1 miles and 1.5 miles of the CDNST would be included within the 250-foot-wide transmission line ROW and 2-mile transmission line corridor, respectively, on private land under Alternative I-A. The crossing of CDNST by the transmission line would occur on private property. Approximately 4 acres of the 250-foot-wide transmission line ROW would be within the 600-acre CDNST SRMA. This is approximately 0.1 percent of the SRMA, which covers about 82 miles of trail. Approximately 179 acres of the 2-mile transmission line corridor, in which roads and construction support areas could be constructed, also would be located within the SRMA. The trail/SRMA is managed to provide primitive recreational experiences and the scenic trail has national importance. Impacts to the trail itself would be minimized by the placement of the transmission line ROW within a designated overhead utility corridor; towers would be placed to avoid surface disturbance near the actual trail. Impacts from construction, as described in Section 3.13.6, would adversely affect the non-mechanized user group (hikers, backpackers, and

equestrians). Visual impacts would be permanent; however, operation of the line is unlikely to appreciably affect the overall recreational experience of the SRMA and trail because of the small percentage of area affected and the recreational experience and character of the trail at this location is already impacted by an existing 230- to 287-kv transmission line and the I-80 crossing. The transmission line would be consistent with SRMA management objectives because the line would be located within a designated utility corridor. Development of additional roads would have adverse impacts to the SRMA by subjecting it to construction noise and visual impacts. Impacts to the SRMA could be reduced with application of the following mitigation measures.

***REC-2**: Within designated recreation management areas, access shall be limited to existing roads whenever practicable. If new and improved access cannot be avoided within these areas, access roads shall be closed or rehabilitated through methods and monitoring developed through consultation with the landowner or land management agency. Methods for closure could include gates, obstructions such as berms or boulders, or partial or full restoration to natural contour or vegetation.*

***REC-3**: If designated corridors exist within the recreation area, new roads and ancillary construction areas shall only be located within designated utility corridors.*

Use of existing roads or placement of new roads and construction areas only within the designated corridor would be highly effective in limiting impacts to areas in which these actions are consistent with area management.

Within the Little Snake FO, no SRMAs would be located within either the 250-foot-wide transmission line ROW or the 2-mile transmission line corridor. The 2-mile transmission line corridor would be located approximately less than one mile outside of the South Sand Wash SRMA, but would not enter the SRMA. The portion of the SRMA that is closest to the 2-mile transmission line corridor is an isolated patch of open OHV play area (Zone I). The prescribed setting is “rural” (i.e., on or near improved country roads and a highway) and with conspicuous and large-scale landscape alteration from OHV use. Construction noise levels and visual disturbances would not be inconsistent with Zone I management. During operation, recreation in the SRMA is unlikely to be appreciably affected by the transmission line because the recreational experience can accommodate large scale landscape alteration.

State-managed Recreation Areas

Red Rim-Daley WHMA. Within Wyoming, approximately 2 miles of the 250-foot-wide transmission line ROW and 2,847 acres of the 2-mile transmission line corridor for Alternative I-A would fall within the Red Rim-Daley WHMA. This 25,177-acre WHMA provides crucial winter habitat for pronghorn antelope and a variety of other wildlife and is used recreationally for hunting and wildlife watching. During construction, approximately 58 acres (0.2 percent of the WHMA) of wildlife habitat would be removed. During peak construction, it is likely that big game would be temporarily displaced from the entire 2,847-acre portion of the 2-mile transmission line corridor within the WHMA (11 percent of the WHMA) due to their avoidance response (see Section 3.7, Wildlife, for a full discussion of noise impacts on wildlife). Access roads and construction staging areas also could be constructed within the 2-mile transmission line corridor, further fragmenting habitat and extending the area affected by construction noise and activity. Implementation of timing restrictions would prevent disturbance to wintering big game (TWE-32 and TWE-33 as well as BLM, USFS, and state wildlife agency restrictions); however, vegetation removal would still occur for transmission line and road construction.

Application of **REC-2** would minimize this impact by limiting access to existing roads within the WHMA and/or requiring full reclamation of any roads that are constructed. This would reduce habitat modification and fragmentation; however, 58 acres of habitat (0.2 percent of the WHMA) would still have some level of vegetation maintenance during operations that could affect habitat.

Construction of Alternative I-A would adversely affect the hunter and wildlife viewer user group through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Recreationists seeking wildlife watching experiences would be adversely impacted by these activities regardless of their timing. Hunters would largely be adversely impacted only if these activities were scheduled during active hunting seasons. Due to the checkerboard nature of land ownership, recreationists may not be able to easily move to other areas of the WHMA to follow wildlife movement, and wildlife may be displaced to areas that are not open to public use. The following additional mitigation measure is recommended to reduce the potential for impacts to hunting:

***REC-4**: Where practicable, construction activities within key hunting locales such as WHMAs/WMAs/ SWAs would not occur during big game hunting seasons.*

Implementation of this measure would be highly effective in reducing impacts to hunting activities and also would be a beneficial impact to worker safety.

Operation of the transmission line is unlikely to affect hunting or other wildlife-dependent recreation activities. Some visitors seeking a completely natural setting (such as wildlife photographers) might choose to visit areas without transmission lines; however, the majority of the WHMA would be visually undisturbed. The noise and activity associated with annual maintenance could temporarily displace wildlife. Application of **REC-1** (scheduling vegetation maintenance outside of big game hunting seasons where practicable) would further minimize impacts to hunting. Please see Section 3.18, Public Health and Safety, and Section 3.12, Visual Resources, for additional details regarding operational noise and visual impacts.

Raftopolous Hunting Lease and Other Public Access Program Areas. Within Colorado, no WMAs would be located within either the 250-foot-wide transmission line ROW or the 2-mile transmission line corridor; however, approximately 617 acres of the 2-mile transmission line corridor would fall within the 11,383-acre Raftopolous hunting lease. The Raftopolous hunting lease area and several smaller parcels of State Trust Lands that are part of the Public Access Program are open to hunting (CPW 2011). Application of **REC-2** would limiting access to existing roads within the area and/or require full reclamation of any roads that are constructed; however, wildlife in this 617-acre portion of the hunting lease (approximately 5 percent of the total lease area) could still be temporarily displaced by noise and activity from nearby ROW construction. However, the other 95 percent of the hunting lease area would still be available to hunters and the areas surrounding the lease are BLM lands that also are open to hunting.

Yampa River State Park. Alternative I-A would pass through the Yampa River State Park and cross the river at an access point west of Maybell, Colorado. Construction and operation would permanently adversely affect the recreation setting for boaters on the Yampa River as the transmission line would substantively change the visual setting of this mostly undeveloped river. Additionally, the State Park's East Cross Mountain access point (River Mile 60) would be within the 2-mile transmission line corridor. The East Cross Mountain access point offers camping and picnicking in addition to river access. The access point would remain open during construction; however, recreational river users, campers, and picnickers would experience noise and visual disturbances. The nearest State Park access point is about 11 miles upstream, but does not offer camping and has minimal facilities. The Maybell Bridge access point, located 3 miles east of Maybell and 28 miles upstream from the East Cross Mountain access point, is the closest improved access point offering camping. There also are two access points downstream (River Mile 55 and 46) managed by the NPS; however, the river is expert class beyond river mile 60 (class 5-6 within Cross Canyon). The following mitigation measures are recommended to reduce impacts to campers in the area:

***REC-5**: No construction shall be allowed after 5:00 p.m. on weeknights, and no construction shall be allowed on weekends, holidays, or the opening of big game hunting seasons in areas that are adjacent to developed recreation sites.*

***REC-6**: Construction zones will be sited such that access to high use recreational areas and trails is not impeded. If public safety concerns are such that current access or use cannot be maintained, the applicant will work with the appropriate land manager to develop alternative access points or redirect users to alternative existing points of access.*

Application of these measures would reduce the adverse impacts from noise and visual disturbances from construction activity during key recreational use times and ensure continued recreational access was available. However, noise and visual impacts would be present during weekdays. Long term visual impacts from operation would not be mitigated.

Local Recreation Areas

There are no local recreation areas within Alternative I-A.

Scenic Byways and Backways

Within the Rawlins FO, Alternative I-A would cross the Outlaw Trail Scenic Loop Highway; one crossing within the 250-foot-wide transmission line ROW, and 1.3 miles within the 2-mile transmission line corridor. Though not a nationally designated scenic byway, this route is recommended for recreational drivers in the area (Carbon County Visitors Council 2012). The transmission line would cross the highway near its junction with I-80. Scenic drivers would be subject to views of road construction near the byway and also would be able to view the transmission line (see Section 3.12, Visual Resources, for more information). Viewshed impacts from development of new access roads within the 2-mile transmission line corridor would be permanent unless fully restored. Impacts would be reduced through application of **REC-2**, which would limited access to existing roads near the highways and/or require full reclamation of any roads that are constructed. During construction, the affected portion of the highway also could experience additional traffic for segments used for employee commute, supply delivery, etc. (see Section 3.16, Transportation).

<u>Alternative I-B</u>

Alternative I-B would cross dispersed recreation areas in three FOs, two specially managed recreation areas, and one wildlife area in Wyoming. Alternative I-B also would also cross the Yampa River once.

BLM Dispersed Recreation Areas

The 2-mile transmission line corridor for Alternative I-B would impact 76,336 acres of dispersed recreation area in the Rawlins FO; 63,149 acres within the Little Snake FO; and 13,799 acres within the White River FO during construction. This is 2.2 percent, 5.0 percent, and less than 1 percent of total available acreage for dispersed recreation in each FO, respectively, and represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Impacts to dispersed recreation and suggested mitigation would be the same as described under Alternative I-A, except that no designated access point to the Yampa River would be located within the 2-mile transmission line corridor.

Within the Rawlins FO, the 250-foot-wide transmission line ROW would encompass 101 acres (less than 0.1 percent) of the Adobe Town DRUA; the 2-mile transmission line corridor would encompass 4,420 acres (less than 2 percent) of the Adobe Town DRUA. The 250-foot-wide transmission line ROW would be located entirely in areas with Front Country ROS designations. These areas are roughly consistent with the Roaded Natural ROS class described in **Table 3.13-4**; development would be consistent with recreation management goals for this area. The 2-mile transmission line corridor primarily would include Front County areas, as well as approximately 460 acres of Middle Country and 20 acres of rural areas. Development of roads and other construction support areas would be fully consistent with recreation goals for the rural areas, but would not be fully consistent with recreation management goals for the Middle Country areas, which provide for a recreational setting with a low concentration of users and some isolation from sights and sounds of development, while allowing for

motorized and mechanized equipment use. Application of **REC-2** would minimize impacts to recreation in these areas.

Operations would affect 1,847 acres of 250-foot-wide transmission line ROW within the Rawlins FO; 1,217 acres within the Little Snake FO; and 373 acres within the White River FO. This represents less than 0.1 percent of each FO. Impacts to dispersed recreation and suggested mitigation would be the same as described under Alternative I-A.

BLM SRMAs or Other Specially Managed Recreation Areas

CDNST SRMA. Impacts to the CDNST SRMA would be the same as described under Alternative I-A. No other SRMAs would be affected by Alternative I-B.

State-managed Recreation Areas

Red Rim-Daley WHMA. Impacts to the Red Rim-Daley WHMA would be the same as described under Alternative I-A.

Yampa River State Park. Impacts to Yampa River State Park would be similar to those described under Alternative I-A except there are no State Park river access sites within the 2-mile transmission line corridor.

Local Recreation Areas

There are no local recreation areas within Alternative I-B.

Scenic Byways and Backways

Impacts to the Outlaw Trail Scenic Loop highway would be the same as described under Alternative I-A.

Alternative I-C

Alternative I-C would cross dispersed recreation areas in three FOs, four specially managed recreation areas, and two wildlife areas in Wyoming and two in Colorado. Alternative I-C also would affect four Yampa River access points and cross the river three times.

BLM Dispersed Recreation Areas

The 2-mile transmission line corridor for Alternative I-C would impact 58,224 acres of dispersed recreation area in the Rawlins FO; 28,629 acres within the Little Snake FO; and 13,799 acres within the White River FO during construction. This is 1.7 percent, 2.3 percent, and less than 1 percent of total available acreage for dispersed recreation in each FO, respectively, and represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Impacts to dispersed hunting, wildlife, and river boating and suggested mitigation would be similar to those described under Alternative I-A, except that Alternative I-C would cross the Yampa River a total of three times and four river access points would fall within the 2-mile transmission line corridor. Impacts to river access points are discussed further under State Recreation Areas, below. Operations would affect 1,350 acres of 250-foot-wide transmission line ROW within the Rawlins FO; 770 acres within the Little Snake FO; and 373 acres within the White River FO. This represents less than 1 percent of each FO. Impacts to dispersed recreation and suggested mitigation would be the same as described under Alternative I-A.

BLM SRMAs or Other Specially Managed Recreation Areas

CDNST SRMA. Impacts to the CDNST SRMA would be the same as described under Alternative I-A.

Juniper Mountain SRMA. Within the Little Snake FO, approximately 1 mile of the 250-foot-wide transmission line ROW and 1,437 acres of the 2-mile transmission line corridor for Alternative I-C would fall within the northern portion of the 1,780-acre Juniper Mountain SRMA. The 250-foot-wide transmission line ROW would cross the Yampa River just west of the SRMA. The SRMA is managed for boating, hunting, camping, and hiking. The portion of the SRMA within the 2-mile transmission line corridor is primarily within Zone 2, which is managed for national- and regional-level destination big game hunting, as well as hiking, camping, and horseback riding. The prescribed setting is natural backcountry, where landscape alterations are uncommon, and the area is managed as VRM Class II within line of sight of the river. Alternative I-C would cross the Yampa River downstream of the SRMA; however, the Juniper Mountain access points would be within the 2-mile transmission line corridor and the transmission line would be visible to river users within the SRMA. Operation of the transmission line would not be in conformance with the prescribed recreation setting for the SRMA (natural backcountry, where landscape alterations are uncommon, and VRM Class II within line of sight of the river) and would result in adverse impacts to user groups such as river boaters, hikers, and backpackers, whose recreational experience is dependent upon a natural landscape. Impacts to river users within the SRMA also are discussed under Yampa River State Park, below.

During construction, approximately 40 acres (2.2 percent of the SRMA) of wildlife habitat would be removed from the 250-foot-wide transmission line ROW. During peak construction, it is likely that big game would be temporarily displaced from the entire 1,437-acre portion of the 2-mile transmission line corridor located within the SRMA (81 percent of the SRMA) due to the avoidance response of big game. Access roads and construction staging areas also could be constructed within the 2-mile transmission line corridor, further fragmenting habitat and extending the area affected by construction noise and activity. Implementation of timing restrictions (TWE-32 and TWE-33 as well as BLM, USFS, and state wildlife agency restrictions) would prevent disturbance to wintering big game; however, vegetation removal would still occur for transmission line and road construction. Application of **REC-2** would minimize this impact by limiting access to existing roads within the SRMA and/or requiring full reclamation of any roads that are constructed. This would reduce habitat modification and fragmentation; however, 40 acres of habitat (2.2 percent of the SRMA) would still have some level of vegetation maintenance during operations that could affect habitat.

Construction would adversely affect the hunter and wildlife viewer user group through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Construction also would adversely affect the non-mechanized user group (hikers, backpackers, and equestrians) that recreate in this SRMA through construction activity and noise. Recreationists seeking wildlife watching experiences or natural settings would be adversely impacted by these activities regardless of their timing. Hunters would be adversely impacted only if these activities were scheduled during active hunting seasons. Due to the importance as a national- and regional-level destination for big game hunting, application of **REC-4** (scheduling construction outside of hunting seasons) is recommended to reduce impacts to this activity. Application of **REC-1** (scheduling vegetation maintenance outside of big game hunting seasons where practicable) would further minimize impacts to hunting during operations. Application of **REC-5** would minimize impacts to all recreation user groups by prohibiting construction during weekends and other high use periods in areas that are adjacent to developed recreation sites.

Serviceberry SRMA. Approximately 1,462 acres (11.8 percent) of the 12,380-acre Serviceberry SRMA lie within the 2-mile transmission line corridor in which roads and other construction facilities would be located. This portion of the SRMA (Zone 2) is managed for non-motorized big game hunting and undeveloped camping. Recreation needs and potential impacts of construction and operation to these user groups are described under Section 3.13.6. Application of mitigation measures **REC-2** would reduce impacts to this area by eliminating roads or requiring full reclamation; however, this portion of the SRMA could still experience noise and activity from nearby ROW construction. This would still result in adverse impacts to non-motorized recreation users such as campers. Hunters also would be affected if construction occurs during hunting season and they could not or chose not to move to

others areas of the SRMA. A very small portion (less than 1 acre) of the 2-mile transmission line corridor also falls within the Little Yampa Canyon SRMA. Application of mitigation measures **REC-2** would reduce impacts to this area by eliminating roads within this area.

State-managed Recreation Areas

Red Rim-Daley WHMA. Impacts to the Red Rim-Daley WHMA would be the same as under Alternative I-A.

Upper Muddy Creek Watershed/Grizzly WHMA. Within Wyoming, approximately 19 acres of the 250-foot-wide transmission line ROW and 1,015 acres of the 2-mile transmission line corridor for Alternative I-C would fall within the 59,780-acre Upper Muddy Creek Watershed/Grizzly WHMA. The WHMA is a utility ROW avoidance area and is managed to protect Colorado River fish species unique to the Muddy Creek watershed and crucial winter habitat for elk and mule deer. Recreation is primarily limited to hunting, angling, and wildlife viewing. Motorized vehicle use is limited to designated roads and vehicle routes. Implementation of timing restrictions during both construction and operation phases (TWE-32 and TWE-33 as well as Rawlins FO restrictions) would prevent disturbance to wintering big game; however, there would still be some loss of big game habitat. Habitat loss would be minimized through application of **REC-2**, which would limit access to existing roads within the WHMA and/or require full reclamation of any roads that are constructed. Construction impacts within the WHMA would primarily affect hunters, anglers and wildlife watchers. Impacts to hunters and wildlife watchers would be similar to those described under the Red Rim-Daley WHMA under Alternative I-A. Application of **REC-4** would reduce this impact by rescheduling construction activities within key hunting locales, such as WHMAs, outside of hunting seasons. Impacts to anglers would be primarily related to maintaining watershed quality and aquatic species habitat. Construction would result in surface distance and erosion and sedimentation that has potential to affect the watershed or aquatic species for which the WHMA is managed; however, total vegetation removal within the 250-foot-wide transmission line ROW comprises less than 1 percent of the WHMA and the area in which roads would be located comprises less than 1.7 percent of the WHMA. Application of **REC-2** would further minimize impacts to the resources used by anglers.

Bitter Brush SWA. Within Colorado, approximately 107 acres of the 250-foot-wide transmission line ROW and 4,921 acres of the 2-mile transmission line corridor for Alternative I-C would fall within the 8,057-acre Bitter Brush SWA. The 250-foot-wide transmission line ROW would be located within a designated utility corridor within the SWA near an existing transmission line. This area is primarily used for hunting and wildlife viewing; public access within the SWA is prohibited from January 15 through April 30. During construction, approximately 1.3 percent of the SWA would be removed from use as wildlife habitat. During peak construction, it is likely that big game would be temporarily displaced from the entire 4,921-acre portion of the 2-mile transmission line corridor located within the SWA (61 percent of the SWA) due to the avoidance response of big game (see Section 3.7, Wildlife, for a full discussion of noise impacts on wildlife). Access roads and construction staging areas also could be constructed within the 2-mile transmission line corridor, further fragmenting habitat and extending the area affected by construction noise and activity. Impacts to recreation would be similar to those described for the Red Rim-Daley WHMA under Alternative I-A. Implementation of timing restrictions would prevent disturbance to wintering big game; however, vegetation removal would still occur for transmission line and road construction. Application of **REC-2** would minimize this impact by limiting access to existing roads within the SWA and/or requiring full reclamation of any roads that are constructed. This would reduce habitat modification and fragmentation; however, 107 acres of habitat (1.5 percent of the SWA) would still have some level of vegetation maintenance during operations that could affect habitat. Construction would adversely affect the hunter and wildlife viewer user group through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Recreationists seeking wildlife watching experiences would be adversely impacted by these activities regardless of their timing. Hunters would largely be adversely impacted only if these activities were scheduled during active hunting seasons. Due to the pattern of

land ownership in the area and the large area of the SWA that would be affected by construction activity, wildlife may be displaced to areas outside the SWA that are not open to public use. Application of **REC-4** would reduce impacts to hunters. Operation of the transmission line is unlikely to affect hunting or other wildlife-dependent recreation activities. Some visitors seeking a completely natural setting (such as wildlife photographers) might choose to visit areas without transmission lines; however, the majority of the SWA would be visually undisturbed. The noise and activity associated with annual maintenance could temporarily displace wildlife. Application of **REC-1** would further minimize impacts to hunting from operations.

Yampa River SWA. Approximately 199 acres (23 percent) of the 860-acre Yampa River SWA lie within the 2-mile transmission line corridor in which roads and other construction facilities would be located; the 250-foot-wide transmission line ROW would be located to the west and outside of the SWA. This SWA is managed primarily for waterfowl hunting and river-based recreation, and includes an unimproved river access site that is part of Yampa River State Park. Construction and operation impacts to river users would be similar to those discussed for Yampa River State Park under Alternative I-A; however, this access point does not offer camping. Application of **REC-2** would minimize impacts to recreation opportunities within the SWA by limiting access to existing roads; however, waterfowl in this 199-acre portion of the SWA could still be temporarily displaced by noise and activity from nearby ROW construction, adversely affecting wildlife viewers and hunters.

Yampa River State Park. Under Alternative I-C, there would be a total of three river crossings of the Yampa River, one slightly downstream of the Yampa River SWA, one downstream of the South Beach (Pump Station) access point, and one downstream of the Juniper Mountain access point. As discussed above, any river crossings would adversely impact the setting of the river and would affect the recreational experiences of boaters and anglers in the area. These impacts constitute an adverse impact to the Yampa River State Park system as a whole, which offers recreation of statewide significance. The Juniper Mountain and South Beach access points are both within the 2-mile transmission line corridor in which roads and other construction support areas could be built. Both access points offer overnight camping. During construction, there would be adverse impacts to recreationists using those areas for camping or other forms of non-mechanized recreation due to construction noise and activity. Application of **REC-2** would minimize this impact by limiting access to existing roads in areas near the access points, but would not eliminate noise and visual impacts from the construction of the transmission line. Campers seeking to avoid impacts at the South Beach access point would need to move 32 miles downstream to the Duffy Mountain access point, or get permission to camp at Loudy Simpson Park, located 5 miles upstream. Campers seeking to avoid impacts at the Juniper Mountain access point would need to camp at the Duffy Mountain campsite (12 miles upstream), or portage the diversion dam within Juniper Canyon and continue on through advanced boating areas to the Maybell Bridge access point, located 6 miles downstream. Application of **REC-5** and **REC-6** would minimize impacts to all recreation user groups by prohibiting construction during weekends and other high use periods in areas that are adjacent to developed recreation sites and ensure continued access to developed recreation sites.

Local Recreation Areas

Juniper Hot Springs. The 2-mile transmission line corridor would encompass Juniper Hot Springs, a privately owned mineral springs and camping area located south of Maybell, Colorado, and is the only known recreational hot springs location in the area. Hot springs visitors and campers would be adversely affected by construction activity and noise. Other camping areas nearby would continue to be available during construction; however, there would be no other hot springs locations for any displaced users. Application of **REC-2** would limit access to existing roads and/or require full reclamation of any new roads. Application of **REC-5** and **REC-6** would reduce impacts to campers and hot springs users by prohibiting construction during weekends and other high use periods and maintaining access to high use areas. However, noise and visual impacts would be present during

weekdays. Section 3.17, Social and Economic Conditions, addresses the economic impacts of construction on this facility.

Scenic Byways and Backways

Within the Rawlins FO, the 2-mile transmission corridor would include 2 miles of the Battle Scenic Highway from Baggs to Encampment (WY 70) and 38 miles of the Outlaw Trail Scenic Loop (Highway 789) from Baggs to Highway 80. These are not nationally designated scenic byways, but are recommended routes for recreational drivers in the area. Scenic drivers using the roads would be subject to views of road construction near the byway and also would be able to view the transmission line (see Section 3.12, Visual Resources, for more information). Viewshed impacts from development of new access roads within the 2-mile transmission line corridor would be permanent unless fully restored. Impacts would be reduced through application of **REC-2**, which would limit access to existing roads near the highways and/or require full reclamation of any roads that are constructed. During construction, portions of the highways also could experience additional traffic on portions used for employee commute, supply delivery, etc. (see Section 3.16, Transportation).

Alternative I-D (Agency Preferred)

Alternative I-D would cross dispersed recreation areas in three FOs, one specially managed recreation area, and one wildlife area in Wyoming. Alternative I-D also would cross the Yampa River once.

BLM Dispersed Recreation Areas

The 2-mile transmission line corridor for Alternative I-D would impact 94,929 acres of dispersed recreation area in the Rawlins FO; 63,149 acres within the Little Snake FO; and 13,799 acres within the White River FO during construction. This is 2.7 percent, 5.0 percent, and less than 1 percent of total available acreage for dispersed recreation in each FO, respectively, and represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Impacts to dispersed recreation and suggested mitigation would be the same as described under Alternative I-A, except that no designated access points to the Yampa River would be located within the 2-mile transmission line corridor.

Operations would affect 2,297 acres of the 250-foot-wide transmission line ROW within the Rawlins FO, 1,217 acres within the Little Snake FO, and 373 acres within the White River FO. This represents less than 1 percent of each FO. Impacts to dispersed recreation and suggested mitigation would be the same as described under Alternative I-A.

BLM SRMAs or Other Specially Managed Recreation Areas

CDNST SRMA. Impacts to the CDNST SRMA would be the same as described under Alternative I-A. No other SRMAs would be affected by Alternative I-D.

Dinosaur National Monument. The 2-mile transmission line corridor for Alternative I-D, including all three Tuttle Easement micro-siting options, includes 16 acres of the Dinosaur National Monument along Deerlodge Road at the road's junction with US Highway 40. One acre of the 250-foot-wide transmission line ROW for Tuttle Easement Micro-Siting Option 3 would be located within the National Monument. Deerlodge Road is the only road entrance to the eastern portion of the monument and provides access to a campground, ranger station, and the only Yampa River boat launch site in the National Monument (NPS 2013a). Construction activities within the National Monument could affect visitor access to the campground, boat launch site and ranger station due to traffic delays or temporary short-term road closures. Construction also could affect visitor's recreation experiences due to noise, delays, and visual intrusions from construction activities. Operation of the Tuttle Easement Micro-Siting Option 3 could affect recreation use and visitors to the national monument because the transmission line would cross Deerlodge Road under this option. Thus, maintenance activities could affect visitor access and recreation experiences due to traffic delays or temporary road closures.

State-managed Recreation Areas

Red Rim-Daley WHMA. Impacts to the Red Rim-Daley WHMA would be the same as described under Alternative I-A.

Yampa River State Park. Impacts to Yampa River State Park would be similar to those described under Alternative I-B.

Local Recreation Areas

There are no local recreation areas within Alternative I-D.

Scenic Byways and Backways

Impacts to the Outlaw Trail Scenic Loop Highway would be the same as described under Alternative I-A.

Alternative Connectors in Region I

There are no designated SRMAs affected by the Mexican Flats, Baggs Alternative, Fivemile Point North Alternative, or Fivemile Point South Alternative connectors. Only general recreation uses that occur on undesignated lands within the Rawlins FO would be affected. In addition, the Mexican Flats, Baggs, and Fivemile Point North alternative connectors would cross the Outlaw Trail Scenic Loop Highway. **Table 3.13-21** summarizes impacts associated with the alternative connectors in Region I.

Table 3.13-21 Summary of Region I Alternative Connector Impacts to Recreation

Alternative Connector	Analysis[1]
Mexican Flats Alternative Connector	Affects recreation on 8,686 acres of undesignated BLM lands within the 3.5 million-acre Rawlins FO. This is 0.2 percent of lands within the FO available for dispersed recreation. Would cross the Outlaw Trail Scenic Loop Highway.
Baggs Alternative Connector	Affects recreation on 20,497 acres of undesignated BLM lands within the 3.5 million-acre Rawlins FO. This is 0.6 percent of lands within the FO available for dispersed recreation. Would cross the Outlaw Trail Scenic Loop Highway.
Fivemile Point North Alternative	Affects recreation on 2,430 acres of undesignated BLM lands within the 3.5 million-acre Rawlins FO. This is 0.1 percent of lands within the FO available for dispersed recreation. Would cross the Outlaw Trail Scenic Loop Highway.
Fivemile Point South Alternative	Affects recreation on 999 acres of undesignated BLM lands within the 3.5 million-acre Rawlins FO. This is <0.1 percent of lands within the FO available for dispersed recreation.

[1] Acres represent the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity.

Alternative Ground Electrode Systems in Region I

The Shell Creek Alternative I-A, Eight Mile Basin (all alternatives), and Separation Creek (all alternatives) would have the greatest impact on recreation as they would be located near designated recreation areas. Smaller areas that are partially located on public land would have less impact on recreation, such as the Separation Flat and Little Snake East alternatives. **Table 3.13-22** provides a comparison of alternative electrode bed locations proposed near the northern terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Table 3.13-22 Summary of Region I Alternative Ground Electrode System Location Impacts to Recreation

Alternative Ground Electrode System Locations	Analysis
Separation Flat – All Alternative Routes	128 acres of disturbance from construction, 39 acres from operations. Affects undesignated BLM lands. Would affect less public recreation use because only a portion of the site is publicly owned.
Shell Creek (Alternatives I-A and I-D)	223 acres of disturbance from construction, 89 acres from operations. Affects undesignated BLM lands within and west of Adobe Town DRUA. Has the greatest impact on recreation due to footprint size and distance from corridor.
Little Snake East (Alternatives I-A, I-B, and I-D)	108 acres of disturbance from construction, 29 acres from operations. Affects undesignated BLM lands. Affects less public recreation use because only a portion of the site is publicly owned.
Little Snake West (Alternative I-A)	121 acres of disturbance from construction, 37 acres from operations. Affects State lands open to public hunting (7 acres of the Little Snake SWA), as well as undesignated BLM lands.
Shell Creek (Alternative I-B)	189 acres of disturbance from construction, 71 acres from operations. Affects undesignated BLM lands west of Adobe Town DRUA. Has a greater impact on recreation because of large footprint and distance from the corridor.
Little Snake West (Alternatives I-B and I-D)	93 acres of disturbance from construction, 21 acres from operations. Affects State lands that are open to public hunting (7 acres of the Little Snake SWA), as well as undesignated BLM lands.
Eight Mile Basin – All Alternative Routes	86 acres of disturbance from construction, 18 acres from operations. Affects 406 acres of the CDNST SRMA and the Rim Lake Recreation site, as well as undesignated BLM lands.
Separation Creek – All Alternative Routes	138 acres of disturbance from construction, 48 acres from operations. Affects 3,956 acres of the Red Rim – Daley WHMA, as well as undesignated BLM lands.

Region I

Alternative I-C would affect the most federal and state-managed recreation sites of the four Region I alternatives. In comparison, Alternative I-D (Agency Preferred) would affect the fewest recreation sites, would not affect any high use sites, and would not cross the Yampa River at a developed access point. Therefore, with implementation of mitigation measures **REC-1**, **REC-2**, **REC-3**, and **REC-4**, this alternative would have the least impact on recreation use, activities, and setting. Alternative I-A (Applicant Proposed) is similar to Alternative I-D, however, Alternative I-A also would affect a high use Yampa River access point, as well as hunting in the Raftopolous Hunting Lease area, though implementation of mitigation measures **REC-2**, **REC-5**, and **REC-6** would reduce adverse impacts to recreation use and users at these two locations.

3.13.6.10 Region II

Table 3.13-23 through **Table 3.13-27** provide a summary of Region II recreation areas/sites by alternative, both within the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor.

Alternative II-A (Applicant Proposed)

Alternative II-A would cross dispersed recreation areas in five FOs and two national forests (including several developed recreation sites), one specially managed recreation area, one state park, nine WMAs/units, two CWMUs, one private campground, and one reservoir. Alternative II-A also would cross three scenic byways.

Table 3.13-23 Region II BLM Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area/Site	Alternative II-A 250-foot-wide ROW Acres (% of Total Area)	Alternative II-A 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW Acres (% of Total Area)	Alternative II-B 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW Acres (% of Total Area)	Alternative II-C 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW Acres (% of Total Area)	Alternative II-D 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW Acres (% of Total Area)	Alternative II-E 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW Acres (% of Total Area)	Alternative II-F 2-mile Corridor Acres (% of Total Area)
BLM White River FO												
Dispersed, undesignated recreation areas	587 (0.04)	22,827 (1.6)	1,389 (<0.1)	57,802 (4)	1,389 (<0.1)	57,802 (4)	587 (0.04)	22,908 (1.6)	587 (0.04)	22,908 (1.6)	587 (0.04)	22,908 (1.6)
BLM Grand Junction FO												
Dispersed, undesignated recreation areas[1]	N/A		600 (0.05)	32,592 (2.5)	600 (0.05)	32,592 (2.5)	N/A		N/A		N/A	
BLM Moab FO												
Dispersed, undesignated recreation areas	N/A		1,806 (0.2)	69,181 (5.8)	1,806 (0.2)	69,181 (5.8)	N/A		N/A		N/A	
Labyrinth Canyon/Gemini Bridges SRMA	N/A		75 (0.02)	4,087 (1.4)	75 (0.02)	4,087 (1.4)	N/A		N/A		N/A	
Utah Rims SRMA	N/A		0	925 (6.0)	0	925 (6.0)	N/A		N/A		N/A	
BLM Vernal FO												
Dispersed, undesignated recreation areas	1,113 (0.07)	38,850 (2.5)	168 (0.01)	5,151 (0.3)	168 (0.01)	5,151 (0.3)	2,337 (0.2)	89,284 (5.7)	1,133 (0.07)	42,226 (2.7)	2,494 (0.2)	92,872 (6)
Fantasy Canyon SRMA	N/A		N/A		N/A		0	54 (78.3)	N/A		0	54 (78.3)
Nine Mile Canyon SRMA	N/A		N/A		N/A		0	1,456 (3.3)	N/A		0	1,453 (3.3)
BLM Price FO												
Dispersed, undesignated recreation areas	N/A		1,684 (0.1)	68,221 (5.0)	1,709 (0.1)	68,157 (5)	186 (0.01)	10,385 (0.8)	5 (0)	366 (0.03)	N/A	
Labyrinth Canyon SRMA	N/A		3 (0.02)	154 (0.4)	3 (0.02)	154 (0.4)	N/A		N/A		N/A	
San Rafael Swell SRMA	N/A		N/A		180 (0.02)	10,589 (1.1)	N/A		N/A		N/A	

Table 3.13-23 Region II BLM Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area/Site	Alternative II-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
BLM Richfield FO						
Dispersed, undesignated recreation areas	38 (0) 1,378 (0.1)	140 (0.01) 5,821 (0.5)	436 (0.03) 16,284 (1.3)	41 (0) 1,574 (0.1)	38 (0) 1,378 (0.1)	38 (0) 1,378 (0.1)
BLM Salt Lake FO						
Dispersed, undesignated recreation areas	3 (0) 323 (0)	N/A	N/A	N/A	5 (0) 1,675 (0.05)	108 (0) 2,489 (0.08)
BLM Fillmore FO						
Dispersed, undesignated recreation areas[1]	1,257 (0.03) 49,166 (1.1)	504 (0.01) 21,815 (0.5)	523 (0.01) 18,657 (0.4)	1,261 (0.03) 48,833 (1.1)	1,261 (0.03) 48,833 (1.1)	524 (<0.01) 22,245 (0.5)
Little Sahara RA	183 (0.3) 5,974 (10)	N/A	N/A	183 (0.3) 5,974 (10)	183 (0.3) 5,974 (10)	N/A

[1] Discrepancies in percentages are due to rounding error.

Table 3.13-24 Region II USFS and Other Federal Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area ROS	Alternative II-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
Ashley National Forest						
Rural	N/A	N/A	N/A	N/A	N/A	N/A
Roaded Modified	N/A	N/A	N/A	N/A	N/A	N/A
Roaded Natural	N/A	N/A	N/A	10 (<0.01) 884 (0.2)	300 (0.07) 7,863 (1.7)	40 (<0.01) 2,118 (0.5)
Semi-Primitive Motorized	N/A	N/A	N/A	1 (0) 2,629 (0.9)	0 1,822 (0.6)	1 (0) 2,629 (0.9)
SPM Within IRA	*N/A*	*N/A*	*N/A*	*0* *2,263 (0.9)*	*0* *1,822 (0.6)*	*1* *2,623 (0.9)*

Table 3.13-24 Region II USFS and Other Federal Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area ROS	Alternative II-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
Remainder in SPM ROS	*N/A*	*N/A*	*N/A*	*0* *6 (<0.01)*	*0* *0*	*0* *6 (<0.01)*
Semi-Primitive Non-Motorized	N/A	N/A	N/A	0 630 (0.2)	0 5,802 (1.6)	0 649 (0.2)
SPNM Within IRA	*N/A*	*N/A*	*N/A*	*0* *630 (0.2)*	*0* *5,784 (1.5)*	*0* *649 (0.2)*
Remainder in SPNM ROS	*N/A*	*N/A*	*N/A*	*N/A*	*0* *18 (<0.01)*	*N/A*
Primitive	N/A	N/A	N/A	N/A	N/A	N/A
Unknown/Private	N/A	N/A	N/A	N/A	N/A	N/A
Total	**N/A**	**N/A**	**N/A**	**11 acres** **4,143 acres**	**300 acres** **15,487 acres**	**41 acres** **5,396 acres**
Uinta National Forest						
Rural	0 23 (1.4)	N/A	N/A	N/A	N/A	N/A
Roaded Modified	160 (0.2) 4,475 (5.3)	N/A	N/A	0 31 (0.04)	242 (0.3) 4,929 (5.8)	242 (0.3) 4,929 (5.8)
Roaded Natural	286 (0.1) 7,904 (2.9)	N/A	N/A	0 17 (0.01)	0 648 (0.2)	31 (0.01) 1,104 (0.4)
Semi-Primitive Motorized	97 (<0.1) 11,800 (3.3)	N/A	N/A	N/A	0 4,752 (1.3)	17 (<0.01) 4,988 (1.4)
SPM Within IRA	*0* *10,102 (2.8)*	*N/A*	*N/A*	*N/A*	*0* *3,581 (1.0)*	*17 (<0.01)* *3,816 (1.1)*
Remainder in SPM ROS	*97 (<0.1)* *1,698 (0.5)*	*N/A*	*N/A*	*N/A*	*0* *1,172 (0.3)*	*0* *1,172 (0.3)*
Semi-Primitive Non-Motorized	N/A	N/A	N/A	N/A	N/A	N/A
Primitive	<1	N/A	N/A	N/A	N/A	N/A

Table 3.13-24 Region II USFS and Other Federal Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area ROS	Alternative II-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
Unknown/Private	2 (<0.01) 11 (<0.01)	N/A	N/A	N/A	0 20 (<0.02)	0 20 (<0.02)
Total	**545 acres** **24,213 acres**	**N/A**	**N/A**	**0 acres** **48 acres**	**242 acres** **10,349 acres**	**290 acres** **11,021 acres**
Manti-La Sal National Forest						
Rural	N/A	N/A	N/A	0 16 (2.0)	N/A	N/A
Roaded Modified	N/A	N/A	N/A	N/A	N/A	N/A
Roaded Natural	26 (0.01) 685 (0.1)	392 (<0.1) 14,379 (2.9)	N/A	173 (0.03) 7,183 (1.4)	31 (0.01) 1,266 (0.3)	31 (0.01) 1,266 (0.3)
Semi-Primitive Motorized	52 (0.01) 3,592 (0.5)	144 (0.02) 7,555 (1.0)	N/A	77 (0.01) 3,727 (0.5)	52 (0.01) 3,592 (0.5)	52 (0.01) 3,592 (0.5)
SPM Within IRA	*26 (<0.01)* *2,156 (0.3)*	*<1 (<0.01)* *3,121 (0.4)*	*N/A*	*0* *574 (0.1)*	*26 (<0.01)* *2,156 (0.3)*	*26 (<0.01)* *2,156 (0.3)*
Remainder in SPM ROS	*26 (<0.01)* *1,436 (0.2)*	*144 (0.02)* *4,434 (0.6)*	*N/A*	*77 (0.01)* *3,153 (0.4)*	*26 (<0.01)* *1,436 (0.2)*	*26 (<0.01)* *1,436 (0.2)*
Semi-Primitive Non-Motorized	N/A	0 10 (0.01)	N/A	0 10 (0.01)	N/A	N/A
SPNM Within IRA	*N/A*	*0* *10 (0.01)*	*N/A*	*N/A*	*N/A*	*N/A*
Remainder in SPNM ROS	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Primitive	N/A	N/A	N/A	N/A	N/A	N/A
Unknown/Private	N/A	N/A	N/A	<1 (0.01) 119 (0.2)	N/A	N/A
Total	**78 acres** **4,277 acres**	**536 acres** **21,944 acres**	**N/A**	**250 acres** **11,055 acres**	**83 acres** **4,858 acres**	**83 acres** **4,858 acres**
Fishlake National Forest						
Rural	N/A	N/A	N/A	N/A	N/A	N/A

Table 3.13-24 Region II USFS and Other Federal Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area ROS	Alternative II-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
Roaded Modified	N/A	N/A	N/A	N/A	N/A	N/A
Roaded Natural	N/A	116 (0.02) 2,595 (0.5)	476 (0.1) 21,822 (4.2)	N/A	N/A	116 (0.2) 2,595 (0.5)
Semi-Primitive Motorized	N/A	0 1,534 (0.1)	400 (0.04) 18,887 (1.8)	N/A	N/A	0 1,534 (0.1)
Within IRA	*N/A*	*0* *0*	*0* *1,151 (0.1)*	*N/A*	*N/A*	*0* *0*
Remainder in SPM ROS	*N/A*	*0* *1,534 (0.1)*	*400 (0.04)* *17,736 (1.7)*	*N/A*	*N/A*	*0* *1,534 (0.1)*
Semi-Primitive Non-Motorized	N/A	N/A	0 111 (0.06)	N/A	N/A	N/A
SPNM Within IRA	N/A	N/A	0 89 (0.05)	*N/A*	*N/A*	*N/A*
Remainder in SPNM ROS	N/A	N/A	22 (0.01)	*N/A*	*N/A*	*N/A*
Primitive	N/A	N/A	N/A	N/A	N/A	N/A
Unknown/Private	N/A	N/A	<1 (0.01) 5 (0.02)	N/A	N/A	N/A
Total	**N/A**	**116 acres** **4,129 acres**	**876 acres** **40,825 acres**	**N/A**	**N/A**	**116 acres** **4,129 acres**
Other Federal Recreation Areas						
Dinosaur National Monument	0 3 (<0.01)	N/A	N/A	0 3 (<0.01)	0 3 (<0.01)	0 3 (<0.01)

Discrepancies in percentages are due to rounding error.

Table 3.13-25 Region II State-managed Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area	Alternative II-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
Emery Farm Castle Dale WMA	N/A	N/A	0 <1 (1)	N/A	N/A	N/A
Currant Creek/Wildcat WMA	152 (0.7) 2,284 (10.7)	N/A	N/A	N/A	N/A	N/A
Nephi WMA-Nephi Unit	0 152 (100)	N/A	N/A	N/A	N/A	N/A
Fillmore WMA	N/A	N/A	0 221 (1.7)	N/A	N/A	N/A
Gordon Creek WMA	N/A	N/A	N/A	155 (0.7) 5,315 (23.4)	N/A	N/A
Indian Canyon WMA-Cottonwood Canyon Unit	N/A	N/A	N/A	N/A	46 (0.6) 1,668 (22)	N/A
North Nebo WMA/Fountain Green Unit	N/A	41 (1.8) 1,347 (58)	N/A	N/A	N/A	N/A
North Nebo WMA—Spencer Fork Unit	111 (1.7) 6,265 (96.4)	N/A	N/A	N/A	111 (1.7) 6,265 (96.4)	111 (1.7) 6,265 (96.4)
Northwest Manti WMA—Birdseye/ Lake Fork Unit	71 (1.9) 2,695 (71.9)	N/A	N/A	N/A	71 (1.9) 2,695 (71.9)	71 (1.9) 2,695 (71.9)
Northwest Manti WMA —Dairy Fork Unit	53 (1.1) 663 (13.3)	N/A	N/A	N/A	52 (1.0) 1,600 (32.2)	52 (1) 1,600 (32.2)
Northwest Manti WMA—Hilltop Conservation Easement	N/A	N/A	N/A	17 (1.6) 696 (64.8)	N/A	N/A
Northwest Manti WMA—Lasson Draw	0 16 (0.7)	N/A	N/A	N/A	0 (0) 16 (0.7)	0 (0) 16 (0.7)
Northwest Manti WMA—Starvation Unit	N/A	N/A	N/A	N/A	24 (0.4) 976 (16.9)	24 (0.4) 976 (16.9)

Table 3.13-25 Region II State-managed Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area	Alternative II-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-D 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-E 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative II-F 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
Strawberry River WMA	5 (0.2) 454 (14.8)	N/A	N/A	N/A	N/A	N/A
South Nebo WMA —Triangle Ranch Unit	29 (1) 1,855 (37.7)	42 (0.9) 2,734 (55.6)	N/A	61 (1.2) 3,584 (72.9)	61 (1.2%) 3,584 (72.9%)	61 (1.2) 3,584 (72.9)
Tabby Mountain WMA—Rabbit Gulch Unit	111 (1.2) 8,088 (89.4)	N/A	N/A	N/A	N/A	N/A
Tabby Mountain WMA—Tabby Mountain Unit	53 (0.1) 839 (2)	N/A	N/A	N/A	N/A	N/A
Starvation State Park	0 459 (6)	N/A	N/A	N/A	N/A	N/A
CWMUs:						
Double R Ranch	41/2,465 (39)	N/A	N/A	N/A	N/A	N/A
Crab Creek	0/211 (2)	N/A	N/A	N/A	0/211 (2)	0/211 (2)
Bear Mountain	N/A	82/4,515 (56)	N/A	N/A	N/A	N/A
Castle Valley Outdoors	N/A	N/A	178/6,067 (57)	N/A	N/A	N/A
Johnson Mountain Ranch	N/A	N/A	61/2,317 (17)	N/A	N/A	N/A
Oak Ranch	N/A	N/A	0/192 (4)	N/A	N/A	N/A
Old Woman Plateau	N/A	N/A	8/123 (2)	N/A	N/A	N/A
Round Valley	N/A	N/A	152/4,683 (59)	N/A	N/A	N/A
Minnie Maud Ridge	N/A	N/A	N/A	355/10,025 (63)	26/1,096 (7)	0/130 (<1)
Emma Park	N/A	N/A	N/A	0/227 (1)	232/7,267 (32)	95/2,684 (12)
Antelope Creek	N/A	N/A	N/A	N/A	129/5,817 (18)	N/A
Scofield Canyons	N/A	N/A	N/A	N/A	0/556 (4)	0/556 (4)
Soldier Summit	N/A	N/A	N/A	N/A	263/9,969 (38)	193/5,477 (21)

Discrepancies in percentages are due to rounding error.

Table 3.13-26 Region II Local Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area	Alternative II-A 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-B 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-C 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-D 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-E 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-F 250-foot-wide ROW (crossings) 2-mile Corridor (miles)
Big Mountain Campground	0 15 (100)	N/A	N/A	0 15 (100)	0 15 (100)	0 15 (100)
Bottle Hollow Reservoir	0 101 (24)	N/A	N/A	N/A	0 101 (24)	N/A
Brough Reservoir	0 <1	N/A	N/A	N/A	N/A	N/A
Cedar Ridges Golf Course	N/A	0 Entire site	0 Entire site	N/A	N/A	N/A
Bear Creek Campground	N/A	0 18 (100)	N/A	N/A	N/A	N/A
Camp Timberlane	N/A	N/A	N/A	N/A	37 (5.1) 381 (53)	31 (4.3) 337 (47)

Table 3.13-27 Region II Scenic Byways and Backway Crossings within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area	Alternative II-A 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-B 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-C 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-D 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-E 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-F 250-foot-wide ROW (crossings) 2-mile Corridor (miles)
Dinosaur Diamond Prehistoric Byway	2 crossings 5 miles	3 crossings 88 miles	3 crossings 76 miles	2 crossings 13 miles**	4 crossings 10 miles**	2 crossings 5 miles
White River /Strawberry Road Scenic Backway	1 crossing 3 miles	N/A	N/A	N/A	N/A	N/A
Nebo Loop Scenic Byway	0 crossings <1 mile	N/A	N/A	0 crossings <1 mile	0 crossings <1 mile	0 crossings <1 mile

Table 3.13-27 Region II Scenic Byways and Backway Crossings within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area	Alternative II-A 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-B 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-C 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-D 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-E 250-foot-wide ROW (crossings) 2-mile Corridor (miles)	Alternative II-F 250-foot-wide ROW (crossings) 2-mile Corridor (miles)
Energy Loop: Huntington/Eccles Canyons National Scenic Byway	N/A	1 crossing 4 miles	N/A	7 crossings 17 miles	1 crossing <2 miles	N/A
Skyline Drive Scenic Backway	N/A	1 crossing 3 miles	N/A	1 crossing 4 miles	0 crossings <1 mile	0 crossings <1 mile
Wedge Overlook/Buckhorn Drive Scenic Backway	N/A	N/A	5 crossings 9 miles	N/A	N/A	N/A
Gooseberry/Fremont Road Scenic Backway	N/A	N/A	1 crossing 2 miles	N/A	N/A	N/A
Indian Canyon Scenic Byway	N/A	N/A	N/A	1 crossing 7 miles**	1 crossing <2 miles**	1 crossing 3 miles**
Nine Mile Canyon Scenic Backway	N/A	N/A	N/A	1 crossing 2 miles	N/A	1 crossing 2 miles
Reservation Ridge Scenic Backway	N/A	N/A	N/A	N/A	N/A	6 crossings 13 miles

** Indian Canyon Scenic Byway shares the same route with Dinosaur Diamond Prehistoric Byway in this portion of the Byway, therefore the acreage identified under the Indian Canyon route also is included in the Dinosaur Diamond route.

BLM Dispersed Recreation Areas

Within Region II, the 250-foot-wide transmission line ROW for Alternative II-A would impact 587 acres of dispersed recreation area in the White River FO, 1,113 acres within the Vernal FO, 38 acres within the Richfield FO, 3 acres within the Salt Lake FO, and 1,257 acres within Fillmore FO. The 2-mile transmission line corridor for Alternative II-A, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass the following acreages of dispersed recreation area within each FO:

- White River FO: 22,827 acres (1.6 percent of total available acreage for dispersed recreation within the FO).
- Vernal FO: 38,850 acres (2.5 percent of total available acreage for dispersed recreation within the FO).
- Richfield FO: 1,378 acres (0.1 percent of total available acreage for dispersed recreation within the FO).
- Salt Lake FO: 323 acres (0.0 percent of total available acreage for dispersed recreation within the FO).
- Fillmore FO: 49,166 acres (1.1 percent of total available acreage for dispersed recreation within the FO).

Construction activities associated with Alternative II-A could temporarily affect the ability of visitors to participate in non-motorized recreation such as hiking or camping by displacing visitors due to noise or visual presence of construction, or making the area inhospitable for wildlife (i.e., would affect wildlife viewing, hunting, and fishing, see Section 3.13.6). Construction is assumed to affect motorized recreation to a lesser degree unless access is restricted to trails. There are no identified high use areas identified within the 2-mile transmission line corridor for the White River, Fillmore, Richfield, and Salt Lake FOs. Construction would affect recreation use, particularly on the weekends (Saturdays; there will be no construction on Sundays) and during the summer at higher elevation areas, and during the spring and fall at lower elevations. In general, there are other nearby locations that visitors could temporarily go during construction activities that offer the same recreation opportunities in a similar environment as are provided in Alternative II-A recreation areas. Operation of the transmission line could affect the visual setting of dispersed recreational opportunities, though in general, the line follows existing transmission lines. Maintenance activities could displace wildlife, affecting hunting or wildlife viewing activities.

Within the Vernal FO, the portion of the transmission line between Starvation State Park and Fort Duchesne would be located near the edge of two deer hunting units (9A and 11). During construction, wildlife may be displaced to areas that are not within the unit. Application of **REC-5**, which would limit construction during the opening of big game seasons in areas near developed recreation sites, would assist in limiting impacts, but would not fully eliminate this risk along the entire portion of the route.

BLM SRMAs or Other Specially Managed Recreation Areas

<u>Little Sahara RA.</u> Within the Fillmore FO, the 250-foot-wide transmission line ROW would cross 183 acres of the 60,000 Little Sahara RA. The 2-mile transmission line corridor, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 5,974 acres of the RA. These acreages comprise 0.3 percent and 10 percent of the RA, respectively. The majority of the area that would be affected is outside the boundary fence and therefore likely receives little use (BLM 2011d). The 2-mile transmission line corridor is well away from designated camping areas. As a result, minimal impacts are expected to recreation from construction. As discussed in Section 3.13.6, some presence of human-constructed structures would be acceptable to the motorized driver user group, the key user

group for the RA. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility and compliance with visual objectives for the RA.

USFS Recreation Areas

Within Region II, the 250-foot-wide transmission line ROW for Alternative II-A would impact 545 acres of dispersed recreation area in the Uinta National Forest and 78 acres within the Manti-La Sal National Forest.

Uinta National Forest. Within the Uinta National Forest, over 80 percent of the 250-foot-wide ROW would fall primarily within the roaded modified and roaded natural ROS classes. These types of areas are managed for recreation in ways that allow for readily evident to moderate evidence of the sights and sounds of human activity. The sights and sounds of construction would be in conformance with area management, though they would cause temporary adverse impacts to scenic drivers, hikers, campers and other non-motorized user groups identified in Section 3.13.6.

Areas classified as semi-primitive motorized, while having some evidence of other users and motorized use, have a low concentration of users, and a predominantly natural or natural-appearing environment. Approximately 11,800 acres of the 2-mile transmission line corridor would be in areas classified as semi-primitive motorized. This is 49 percent of the total acreage of the 2-mile transmission line corridor located within the Uinta National Forest (24,213 acres) and 3.3 percent of all semi-primitive motorized ROS acreage within the Uinta National Forest. The total 2-mile transmission line corridor acreage represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for the semi-primitive motorized areas. Over 85 percent of this acreage (or 10,102 acres) would be located within one or more IRAs. Construction within IRAs would use roadless construction methods identified in **Appendix D**, including helicopter construction, overland travel smaller ROW, selective vegetation management, etc. This would reduce some impacts to semi-primitive motorized areas by eliminating road construction; however, helicopter construction and/or overland travel itself also likely would be a temporary adverse impact to recreationists in these areas. Please see Section 3.15, Special Designation Areas, for additional impacts to IRAs. The remaining 1,698 acres of semi-primitive motorized areas would not have roadless construction restrictions. This area comprises approximately 0.5 percent of all semi-primitive motorized acreage within the Uinta National Forest.

As discussed in Section 3.13.6, construction would adversely affect the hunters and wildlife viewer user groups through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Recreationists seeking wildlife watching experiences or natural settings would be adversely impacted by these activities regardless of their timing. Hunters would be adversely impacted only if these activities were scheduled during active hunting seasons. Additionally, the 2-mile transmission line corridor would be partially located in areas where adjacent deer hunting units abut (units 17A and 17V and units 16A and 12/16B/16C).

High use/developed areas within the Uinta National Forest identified within the 2-mile transmission line corridor include Long Hollow Trail, Teats Mountain Trail, Strawberry River Day Use Area, Aspen Grove Campground and Marina near Strawberry Reservoir, Sheep Creek Snowmobile Area, and Forest Service Road 090 (Sheep Creek Road) that largely parallels the transmission line, is a part of the Strawberry ATV System, and provides access to the Great Western Trail. Construction would adversely affect the non-mechanized user group (hikers, campers, and equestrians) that recreate on the trails listed above through construction activity and noise. Campers, day use area users, and boaters also would be adversely affected by construction activity and noise. Motorized drivers also would be adversely affected by construction if access to the trails listed above was altered. Use of the

trails and facilities may be altered if recreationists choose to visit other locations due to construction activities nearby.

During construction, wildlife may be displaced to areas that are not within the unit for which hunters are licensed. Construction would affect recreation use at these sites particularly on the weekends (Saturdays; there will be no construction on Sundays) and during the summer at higher elevation areas, and during the spring and fall at lower elevations. With the exception of hunters, who may not be able to follow wildlife to adjoining units, there are other nearby locations that visitors could temporarily go during construction activities that offer the same recreation opportunities in a similar environment. Application of **REC-5** and **REC-6** would reduce impacts to campers and day use area users by limiting construction on weekends and prohibiting activities on holidays or other key use times (such as the opening of big game seasons) near developed recreation sites and ensuring continued access to high use areas and trails.

Operation of the transmission line would affect the visual setting of recreational opportunities around the Aspen Grove Campground, the Strawberry River Day Use Area, and the trails listed above, as well as the access roads to these facilities. Non-motorized user groups such as hikers, campers, and picnickers may be affected by the presence of the transmission line; however, OHV user groups are not expected to be adversely affected by the presence of a transmission line (see Section 3.13.6). Project roads near the high use/developed areas listed above could result in unauthorized OHV use (and associated resource damage, noise, etc.) as well as permanent visual impacts. Please see Section 3.13.6.8 regarding potential impacts from Project access roads. Implementation of **REC-2** would limit impacts from new access roads. Maintenance activities could displace wildlife, thus affecting hunting or wildlife viewing activities. Application of **REC-1** would reduce this impact by scheduling maintenance activities outside of hunting seasons. Section 3.12, Visual Resources and **Appendix I** provide additional detail regarding visibility from the Uinta National Forest, as well as from the boat launch and campground areas, which are a KOP (V-34) used for visual analysis. The Strawberry IRA and Cedar Knoll IRA micro-siting options would not substantially affect the impact analysis for recreation.

Manti-La Sal National Forest. Within the Manti-La Sal National Forest, over 52 acres (67 percent) of the 250-foot-wide transmission line ROW and 3,592 acres (84 percent) of the 2-mile transmission line corridor would be located in areas classified as semi-primitive motorized. These acreages comprise 0.01 and 0.5 percent of all semi-primitive motorized areas within the Manti-La Sal National Forest, respectively. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for these areas. Construction would adversely affect recreationists in these areas as described above. Approximately 2,156 acres of the semi-primitive motorized area within the 2-mile transmission line corridor would be located in IRAs. Using roadless construction methods would reduce some impacts to semi-primitive motorized areas by eliminating road construction; however, helicopter construction and/or overland travel itself also likely would result in a temporary adverse impact to recreationists in these areas. The remaining 1,436 acres of semi-primitive motorized area within the 2-mile transmission line corridor would be outside IRAs and comprise 0.2 percent of all areas classified as semi-primitive motorized within the Manti-La Sal National Forest.

Additionally, the route for the proposed 2-mile transmission line corridor would be partially located near the border of deer hunting units 16A and 12/16B/16C. During construction, wildlife may be displaced to areas that are not within the unit for which hunters are licensed. Construction would affect recreation use particularly on the weekends (Saturdays; there will be no construction on Sundays). Application of **REC-5** would reduce impacts to campers and hunters by prohibiting construction on weekends and on holidays or other key use times, such as opening days of hunting seasons, near developed recreation sites. Operation of the transmission line is not expected to affect recreational opportunities because, in general, the proposed transmission line would follow existing transmission lines. Maintenance

activities could displace wildlife, affecting hunting or wildlife viewing activities. Application of **REC-1** would reduce this impact by scheduling maintenance activities outside of hunting seasons.

Other Federal Recreation Areas

Dinosaur National Monument. The 2-mile transmission line corridor for Alternative II-A encompasses 3 acres of the Dinosaur National Monument on the south side of Highway 40 across from Harpers Corner Road, which is the main entrance to the monument. The monument's visitor center and other facilities are located on the north side of Highway 40 on Harpers Corner Road, outside of the 2-mile transmission line corridor. Given that park facilities are located across the highway and up Harpers Corner Road, and the majority of the monument is located much further north, it is unlikely that any recreation use occurs south of Highway 40 and therefore impacts to recreation within the monument are unlikely.

State-managed Recreation Areas

WMAs. The 250-foot-wide transmission line ROW for Alternative II-A would cross eight WMAs/units; the 2-mile transmission line corridor also would include acreage in an additional two WMAs. All ten WMAs primarily are managed for big game and protection of big game winter habitat. Substantial portions of five WMAs would be within the 2-mile transmission line corridor:

- Tabby Mountain WMA—Rabbit Gulch Unit: 8,088 acres (89 percent) of the WMA;
- North Nebo WMA—Spencer Fork Unit: 6,265 acres (96 percent) of the WMA;
- Northwest Manti WMA—Birdseye/Lake Fork Unit: 2,695 acres (72 percent) of the WMA;
- South Nebo WMA—Triangle Ranch Unit: 1,855 acres (38 percent) of the WMA; and
- Nephi WMA—Nephi Unit: 152 acres (100 percent) of the WMA.

Ten to 15 percent of the Northwest Manti WMA – Dairy Fork Unit, Currant Creek/Wildcat WMA, and Strawberry River WMA would be within the 2-mile transmission line corridor.

Two percent or less of the remaining two WMAs (Tabby Mountain WMA – Tabby Mountain Unit and Northwest Manti WMA – Lasson Draw) would be within the 2-mile transmission line corridor.

The acreage within the 2-mile transmission corridor represents the maximum area that could be temporarily removed from use as wildlife habitat and quality hunting area due to surface disturbance, increased noise, and human activity, and would encompass substantial portions of five WMAs. With the exception of the Currant Creek/Wildcat, Nephi, and Strawberry River WMAs, all of these units are closed to public access in winter and spring to protect wintering wildlife. Adherence to timing restrictions during both construction and operation phases would prevent disturbance to wintering big game; however, there would still be some loss of big game habitat through vegetation removal, noise and human activity. These impacts within the WMAs primarily would affect hunting and wildlife watching recreation opportunities.

Agreements for four of these WMAs contain language that could prohibit development of a transmission line and/or access roads if impacts are not sufficiently mitigated. The conservation agreement language for the North Nebo WMA—Spencer Fork Unit specifically precludes industrial, commercial, or other development that is not consistent with the conservation values and purpose of the WMA. The South Nebo WMA —Triangle Ranch Unit contains a reversionary clause on some parcels if land use changes from "big game management." As CUP mitigation properties, the Currant Creek/Wildcat and Strawberry River WMAs, also have reversionary clauses that require them to manage the properties for the purposes for which they were acquired. Additionally, the Tabby Mountain WMA is adjoined by a private conservation easement area (Sand Wash/Sink Draw) that prohibits development of overhead transmission lines (see Section 3.14, Land Use). Development of a

transmission line or access roads within these WMAs would therefore not be in conformance with area management.

Habitat loss would be minimized through application of **REC-2**, which would limit access to existing roads within the WMA and/or require full reclamation of any roads that are constructed. Application of **REC-4** would reduce recreation impacts by rescheduling construction activities within key hunting locales, such as WMAs, outside of hunting seasons. During operations, the 250-foot-wide transmission line ROW would still have some level of vegetation maintenance during operations that could affect wildlife habitat, and maintenance-related noise could temporarily affect adjacent hunting and wildlife viewing opportunities by making the area less hospitable for wildlife. Application of **REC-1** (scheduling vegetation maintenance outside of big game hunting seasons where practicable) would further minimize impacts to hunting and wildlife viewing.

CWMUs. The 250-foot-wide transmission line ROW for Alternative II-A also would cross the 6,390-acre Double R Ranch CWMU. Approximately 40 acres would be within the 250-foot-wide transmission line ROW; the 2-mile transmission line corridor would encompass 2,465 acres (40 percent) of the CWMU. Approximately 200 acres of the 2-mile transmission line corridor also would be within the 10,409-acre Crab Ranch CWMU. Impacts to hunting within the 2-mile transmission line corridor area would be similar to those described above. Decisions regarding road construction and timing of construction would be up to the private landowner.

Starvation State Park. The 2-mile transmission line corridor crosses approximately 459 acres of the 7,324-acre Starvation State Park. This park offers boating and other water sports at Starvation Reservoir and features a developed camping area as well as undeveloped camping areas. The 2-mile transmission line corridor would be located on the reservoir side that is opposite of the developed camping areas, but would be near the Rabbit Gulch primitive camping area. Campers in this area would be most disturbed by the sights and sounds of construction. There are other primitive camping areas located around the reservoir that could be used by any displaced campers from Rabbit Gulch. Scenic views are not anticipated to be highly affected as the area is already disturbed by oil and gas wells and the existing steel lattice structures of an existing transmission line. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility.

Local Recreation Areas

Big Mountain Campground. The 2-mile transmission line corridor would encompass approximately 15 acres of the Big Mountain Campground (the entire site), a private campground off Highway 132 in Nephi. Construction would affect camping in this area through noise and visual disturbances. There would be many other camping areas on nearby NFS lands that would not be affected and would continue to be available for use during construction. Section 3.17, Social and Economic Conditions, addresses the economic impacts of construction on this facility. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility from a key observation point (KOP) F-2, which is located near the campground.

Application of **REC-2** would limit access to existing roads and/or require full reclamation of any new roads. Application of **REC-5** and **REC-6** would reduce impacts to campers by prohibiting construction during weekends and other high use periods and maintaining access to high use areas.

Bottle Hollow and Brough Reservoirs. The 2-mile transmission line corridor also would cross Brough Reservoir, a blue ribbon trout fishing area, and Bottle Hollow Reservoir, a reservoir managed by the Uintah and Ouray Indian Reservation. Construction is not expected to impact fishing in these areas; however, restricted access would be an adverse impact to recreational users.

Application of **REC-6** would be effective in reducing impacts to the users of these areas by ensuring continued access, though there could be some traffic delays accessing recreational areas. Section

3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility from KOP V-21, which is located near Bottle Hollow Reservoir.

Scenic Backways and Byways

Dinosaur Diamond Prehistoric Byway. Within Region II, the 250-foot-wide transmission line ROW for Alternative II-A would cross the 480-mile Dinosaur Diamond Prehistoric Byway (Highway 40/191) south of Roosevelt, Utah and again near Dinosaur, Colorado. Approximately five miles of the Byway would be located within the 2-mile transmission line corridor in which roads and other construction facilities would be located. During construction, scenic drivers would be adversely affected by construction activities near the highway. Other impacts would include temporary traffic delays due to construction during key construction times (such as stringing of the lines). No impacts from operation are expected because the area near Roosevelt, in which the transmission line would be visible from the Byway, is a rural area where transmission lines and other manmade structures are already visible; and the portion of the 2-mile transmission line corridor near Dinosaur, Colorado would follow an existing transmission line. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the Byway.

White River/Strawberry Road Scenic Backway. Within the Uinta National Forest, the 250-foot-wide transmission line ROW would cross the 28-mile White River/Strawberry Road Scenic Backway near Strawberry Reservoir. Approximately three miles of the Backway would be within the 2-mile transmission line corridor in which roads and other construction facilities would be located. The visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving on portions of the Scenic Backway nearest to the 250-foot-wide transmission line ROW; scenic drivers using the Backway also could be subject to views of road construction within the 2-mile transmission line corridor (see Section 3.12, Visual Resources, for more information). Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the backway.

Nebo Loop Scenic Byway. East of Nephi, the transmission line would be located on the south side of Highway 132, opposite the turnoff for the 37-mile Nebo Loop Scenic Byway (Salt Creek Canyon Road). Less than 1 mile of the Byway would be within the 2-mile transmission line corridor; scenic drivers would see construction areas as they enter/leave the Byway. Section 3.12, Visual Resources, and Appendix I provide additional detail regarding visibility along the Byway and conformance with visual objectives in this area. East of the Byway, the transmission line would cross Highway 132, potentially causing some traffic delays for those accessing the Byway during key construction periods.

Alternative II-B

Alternative II-B would cross dispersed recreation areas in seven FOs and two national forests (including several developed recreation sites), three specially managed recreation areas, and two WMAs. Alternative II-B also would affect three scenic byways.

BLM Dispersed Recreation Areas

Within Region II, the 250-foot-wide transmission line ROW for Alternative II-B would impact seven FOs. The 2-mile transmission line corridor for Alternative II-B, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass the following acreages of dispersed area within each FO:

- White River FO: 57,802 acres (4.0 percent of total available acreage for dispersed recreation within the FO).
- Grand Junction: 32,592 acres (2.5 percent of total available acreage for dispersed recreation within the FO).

- Vernal FO: 5,151 acres (0.3 percent of total available acreage for dispersed recreation within the FO).
- Moab FO: 69,151 acres (5.8 percent of total available acreage for dispersed recreation within the FO).
- Price FO: 68,221 acres (5.0 percent of total available acreage for dispersed recreation within the FO).
- Richfield FO: 5,821 acres (0.5 percent of total available acreage for dispersed recreation within the FO).
- Fillmore FO: 21,815 acres (0.5 percent of total available acreage for dispersed recreation within the FO).

Construction impacts within the White River, Vernal, Richfield, and Fillmore FOs would be similar to those identified under Alternative II-A, but would vary in intensity based on acreage and would affect different portions of the FO. There are no areas of high use identified within the dispersed recreation areas for these FOs and there are public lands adjacent to the affected areas that can accommodate any displaced dispersed recreation activities. Within the Grand Junction and Price FOs, recreation use within the 2-mile transmission line corridor is likely to include OHV use, hunting, recreational shooting, and other dispersed recreation activities. There are no identified high use areas within these portions of the FOs.

Within the Moab FO, acreage within the 2-mile transmission line corridor primarily would be along the Highway 70/6/50 corridor. With the exception of scenic driving, this is not a high use recreation area, and there are public lands adjacent to affected areas that can accommodate any displaced recreation activities. The 250-foot-wide transmission line ROW would be partially in a designated utility corridor and partially within ROW avoidance areas, and would cross the highway once. Construction of the transmission line (and accompanying roads or construction support areas) would alter the scenic quality and recreation setting for scenic drivers on the highway. Wire installation across the highway would cause temporary delays in traffic. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility from Highway 70.

BLM SRMAs or Other Specially Managed Recreation Areas

Labyrinth Canyon/Gemini Bridges SRMA. Within the Moab FO, approximately 75 acres of the 250-foot-wide transmission line ROW and 4,807 acres of the 2-mile transmission line corridor would fall within the 300,600-acre Labyrinth Canyon/Gemini Bridges SRMA. These acreages comprise 0.02 percent and 1.4 percent of the SRMA, respectively. This SRMA is managed to provide destination recreation including river running, camping, mountain biking and other recreation opportunities. Within the SRMA, the transmission line would be within a designated utility corridor and in conformance with area management. The portion of the SRMA impacted by the transmission line is the far northern end, near Highway 6/50, and would not be expected to be a high use area for hiking, camping, and other non-motorized activities. However, any construction activity would be an adverse impact to river users entering the SRMA in this area.

Labyrinth Canyon SRMA. Within the Price FO, approximately 154 acres of the Labyrinth Canyon SRMA (less than 0.5 percent of the SRMA) would be within the 2-mile transmission line corridor. Impacts to recreation within this area would be similar to those described for the Labyrinth Canyon/Gemini Bridges SRMA due to its location along the Green River.

Utah Rims SRMA. Approximately 925 acres of the 2-mile transmission line corridor would fall within the 15,424-acre Utah Rims SRMA. This acreage comprises 6.0 percent of the SRMA. The SRMA is managed to provide a variety of community-based dispersed, motorized recreation opportunities (primarily OHV use). It is assumed that the aesthetic impacts from construction or operation of the

transmission line would not substantively affect recreational use of the OHV trails, due to the noise of the motorized vehicles used on the trail system; however, other user groups such as campers located within the 2-mile transmission line corridor would be adversely affected by the construction noise and activity. Restricted access to the trail system during construction would be an adverse impact for recreational users in this area. Application of **REC-6** would reduce impacts to recreational users in this area by allowing users continued access to all or part of the trail system.

USFS Recreation Areas

Within Region II, Alternative II-B would impact dispersed recreation areas in the Manti-La Sal National Forest and the Fishlake National Forest.

Manti-La Sal National Forest. Approximately 536 acres of the 250-foot-wide transmission line ROW and 21,944 acres of the 2-mile transmission line corridor would fall within the Manti-La Sal National Forest. Over 70 percent of the acreage within the 250-foot-wide transmission line ROW would fall exclusively within areas classified as roaded natural. These types of areas are managed for recreation in ways that allow for readily evident to moderate evidence of the sights and sounds of human activity. The sights and sounds of construction would be in conformance with area management, though they would cause temporary adverse impacts to scenic viewers, hikers, campers and other non-motorized user groups identified in Section 3.13.6. Areas classified as semi-primitive motorized, while having some evidence of other users and motorized use, have a low concentration of users and a predominantly natural or natural-appearing environment. Approximately 7,555 acres within the 2-mile transmission line corridor would be classified as semi-primitive motorized. This is 34 percent of the total acreage of the 2-mile transmission line corridor located within the Manti-La Sal National Forest (26,584 acres) and 1.0 percent of all semi-primitive motorized acreage within the Manti-La Sal National Forest. The total acreage within the 2-mile transmission line corridor represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Approximately 10 acres (0.1 percent) of the total acreage of the 2-mile transmission line corridor would be within areas classified as semi-primitive non-motorized. This acreage comprises 0.01 percent of all semi-primitive non-motorized ROS acreage within the Manti-La Sal National Forest. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for these areas. Over 40 percent of acreage within the 2-mile transmission line corridor in areas classified as semi-primitive motorized (or 3,121 acres) and all of the acreage within semi-primitive non-motorized areas would be located within IRAs. Construction within IRAs would use roadless construction methods identified in **Appendix D**. This would reduce some impacts to semi-primitive motorized and non-motorized areas by eliminating road construction; however, helicopter construction and/or overland travel itself also likely would be a temporary adverse impact to recreationists in these areas. The remaining 4,434 acres of semi-primitive motorized area within the 2-mile transmission line corridor would be outside IRAs and comprise 0.6 percent of all areas classified as semi-primitive motorized within the Manti-La Sal National Forest.

As discussed in Section 3.13.6, construction would adversely affect the hunter and wildlife viewer user group through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Construction also would adversely affect the non-mechanized user group (hikers, campers, and equestrians) through construction activity and noise. During construction, wildlife may be displaced to areas that are not within the unit for which hunters are licensed. Hunters would be adversely impacted only if these activities were scheduled during active hunting seasons. The majority of this route is well within Hunt Unit 12 and therefore not likely to affect hunters' ability to track displaced game. Recreationists seeking wildlife watching experiences or natural settings would be adversely impacted by construction activities regardless of their timing.

Within the Manti-La Sal National Forest, Alternative II-B would cross several high use/developed areas, including the Arapeen ATV Trail System area, Indian Creek Group Campground, and Potters

Pond Campground. Alternative II-B would cross almost all of the OHV routes within the northern part of the Arapeen ATV Trail System, including the Great Western Trail. The Great Western Trail is one of the few long distance north/south trails in this area. Restricted access to the trail during the summer would be a substantial, but temporary adverse impact to both motorized and non-motorized user groups. Application of **REC-6** would allow access to the trail to continue, although there could be delays in use during key construction times. Use of other OHV routes also would be affected from construction activities potentially altering the ability of users to drive on the route through construction areas. However, use of mainly small loop routes would be affected; routes of similar difficulty and length would be available for use in the southern part of the trail system (USFS 2010a). Construction activities related to Alternative II-B also would affect use of the Indian Creek Group Campground and Potter's Pond Campground as campers may choose alternate locations to avoid construction activities and noise. Other nearby dispersed campsites on Miller Flat Road would continue to be available for use during construction activities. Application of **REC-5** and **REC-6** would reduce impacts to campers by limiting construction on weekends and prohibiting activities on holidays or other key use times near developed recreation sites and ensuring continued access to high use areas.

Operation of the transmission line also would affect the visual setting of recreation opportunities and access roads, although in general, the line follows an existing high voltage wooden H-frame transmission line. Non-motorized users such as hikers may be affected by presence of the transmission line; however, OHV users are not expected to be adversely affected by the presence of the transmission line (see Section 3.13.6). Project roads near the high use/developed areas listed above could result in unauthorized OHV use (and associated resource damage, noise, etc.) as well as permanent visual impacts. Please see Section 3.13.6.8 regarding potential impacts from Project access roads. Implementation of **REC-2** would limit impacts from new access roads. Maintenance activities could displace wildlife, thus affecting hunting or wildlife viewing activities. Application of **REC-1** would reduce this impact by scheduling maintenance activities outside of hunting seasons. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility from KOPs P-16 and P-17, which are located at the Indian Creek and Potter's Pond campgrounds. Operation and maintenance noise and activities could displace wildlife, affecting hunting or wildlife viewing activities. Application of **REC-1** would reduce this impact, by scheduling maintenance activities outside of hunting seasons.

Fishlake National Forest. Approximately 116 acres of the 250-foot-wide transmission line ROW would fall within areas classified as roaded natural within the Fishlake National Forest. The 2-mile transmission line corridor for Alternative II-B, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 4,129 acres of the Fishlake National Forest. Thirty-seven percent of this acreage (1,534 acres) would be within areas classified as semi-primitive motorized. This acreage, which comprises 0.1 percent of all semi-primitive motorized acreage within the Fishlake National Forest, would not be in conformance with recreation goals for this ROS classification. None of this acreage would be within IRAs. Impacts to recreation within the Fishlake National Forest from construction would be similar to those discussed for national forests under Alternative II-A, and above. There are no identified high use areas within this portion of the Fishlake National Forest; however, the proposed 2-mile transmission line corridor would be partially located near the northern edge of a UDWR limited entry hunt unit (16A). Construction during hunting season within or near this unit would adversely affect hunters through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Hunters may not be able to easily move to other areas to follow wildlife movement, and wildlife may be displaced to areas that are not within the unit. Additionally, the limited entry nature of this unit is such that it would be difficult to find a substitute hunting opportunity. Application of mitigation measures **REC-1**, **REC-2**, **REC-4**, and **REC-5** would assist in reducing impacts within the hunting unit during both construction and operation. Operation of the transmission line also would affect the visual setting of dispersed recreational opportunities although in general, the line follows existing transmission lines.

State-managed Recreation Areas

WMAs. The 250-foot-wide transmission line ROW for Alternative II-B would cross the South Nebo WMA – Triangle Ranch Unit and the Moroni subunit of the North Nebo WMA – Fountain Green Unit. Both WMAs are managed to protect big game winter range. Impacts to the South Nebo WMA – Triangle Ranch Unit would be similar to those identified under Alternative II-A, but would affect a greater portion of the WMA (the 2-mile transmission line corridor would encompass approximately 2,734 acres or 56 percent of the WMA). Approximately 41 acres of the 250-foot-wide transmission line ROW and 1,347 acres of the 2-mile transmission line corridor would fall within the North Nebo – Fountain Green Unit. This comprises 2 percent and 58 percent of the WMA, respectively. The unit is closed to public access in winter and spring to protect wintering wildlife. Adherence to timing restrictions during both construction and operation phases would prevent disturbance to wintering big game; however, there would still be some loss of big game habitat through vegetation removal, noise, and human activity that would affect hunting and wildlife watching recreation opportunities.

The South Nebo WMA —Triangle Ranch Unit contains reversionary clauses on some parcels if land use changes from “big game management.” Development of a transmission line or access roads within these parcels would not be in conformance with area management. Habitat loss would be minimized through application of **REC-2**, which would limit access to existing roads within the WMA and/or require full reclamation of any roads that are constructed. Application of **REC-4** would reduce recreational impacts by rescheduling construction activities within key hunting locales, such as WMAs, outside of hunting seasons. During operations, the 250-foot-wide transmission line ROW would still have some level of vegetation maintenance during operations that could affect wildlife habitat, and maintenance-related noise could temporarily affect adjacent hunting and wildlife viewing opportunities by making the area less hospitable for wildlife. Application of **REC-1** (scheduling vegetation maintenance outside of big game hunting seasons where practicable) would further minimize impacts to hunting and wildlife viewing.

CWMUs. The 250-foot-wide transmission line ROW for Alternative II-B also would cross the 8,037-acre Bear Mountain CWMU. Approximately 82 acres would be within the 250-foot-wide ROW; the 2-mile transmission line corridor would encompass 4,515 acres (56 percent) of the CWMU. Impacts to hunting within the 2-mile transmission line corridor area would be similar to those described above. Decisions regarding road construction and timing of construction would be up to the private landowner.

Local Recreation Areas

Bear Creek Campground. Approximately 18 acres of Emery County’s Bear Creek Campground (the entire site) would be located within the 2-mile transmission line corridor; the campground would not be located within the 250-foot-wide transmission line ROW. Construction within the 2-mile transmission line corridor would adversely affect campers, particularly during summer weekends, due to construction activity and noise. Recreation use of the campground also may be affected if campers are displaced to nearby campgrounds in the Manti-La Sal National Forest. Application of **REC-2** would limit access to existing roads and/or require full reclamation of any new roads. Application of **REC-5** and **REC-6** would reduce impacts to campers by prohibiting construction during weekends and other high use periods and maintaining access to high use recreation areas. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility from KOP P-32, which is located near the campground.

Cedar Ridges Golf Course. The entire Cedar Ridges Golf Course near Rangely, Colorado would be located within the 2-mile transmission line corridor; however, the golf course would not be located within the 250-foot-wide transmission line ROW. Construction activity and noise within the 2-mile transmission line corridor would adversely affect golfers, as well as use of the golf course, particularly during the summer, if golfers are displaced to another location. Application of **REC-2** would limit access to existing roads and/or require full reclamation of any new roads. Application of **REC-5** and

REC-6 would reduce impacts to golfers by prohibiting construction during weekends and other high use periods and maintaining access to high use recreation areas.

Scenic Backways and Byways

Dinosaur Diamond Prehistoric Byway. Under Alternative II-B, the 250-foot-wide transmission line ROW for Alternative II-B would largely parallel the 480-mile Dinosaur Diamond Prehistoric Byway along the Highway 70/6/50 corridor between the McInnis NCA and Green River, Utah and along Highway 6 between Green River and Price. Over 88 miles of the Byway would fall within the 2-mile transmission line corridor in which roads and other construction facilities would be located. Impacts would include temporary traffic delays due to construction during key construction times (such as stringing of the lines), and alteration of the recreation setting for scenic drivers along these portions of the Byway. However, both affected portions of the Byway have existing transmission lines adjacent to the highway. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the Byway.

Energy Loop: Huntington/Eccles Canyons Scenic Byway. West of Huntington, the 250-foot-wide transmission line ROW would cross the 83-mile Energy Loop: Huntington/Eccles Canyons Scenic Byway (SR-31), and generally would parallel the Byway for about 4 miles, although the 250-foot-wide transmission line ROW would be located about 1.5 miles to the south of SR 31. Approximately 4 miles of the Byway would fall within the 2-mile transmission line corridor; about 1 mile of the Byway would fall within the 250-foot-wide transmission line ROW. Construction activity at the crossing or road construction within the portion of the 2-mile transmission line corridor adjoining the Byway would adversely affect the scenic view of the Byway. Visual disturbances from construction of new roads would be permanent unless fully restored. During construction, portions of the Byway also could experience additional traffic on segments used for employee commute, supply delivery, etc. (see Section 3.16, Transportation). Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the Byway.

Skyline Drive Scenic Backway. Southwest of Mt. Pleasant, the 250-foot-wide transmission line ROW would cross Skyline Drive Scenic Backway; approximately 3 miles of the Backway would be within the 2-mile transmission line corridor. There are existing transmission lines in this area. Scenic drivers using the Backway could be subject to views of road construction within the 2-mile transmission line corridor (see Section 3.12, Visual Resources, and **Appendix I** for more information on visual impacts to the Backway). Visual disturbances from construction of new roads would be permanent unless fully restored. During construction, portions of the Backway also could experience additional traffic on segments used for employee commute, supply delivery, etc. (see Section 3.16, Transportation and Access).

Alternative II-C

Alternative II-C would cross dispersed recreation areas in seven FOs and one national forest (including several developed recreation sites), four specially managed recreation areas and two WMAs. Alternative II-C also would affect three scenic backways/byways.

BLM Dispersed Recreation Areas

Under Alternative II-C, impacts to the White River, Grand Junction, Moab, and Vernal FOs would be the same as under Alternative II-B. Impacts within the Price and Fillmore FOs would affect similar amounts of dispersed recreation area as Alternative II-B, although in different locations. There are no high use areas identified within the analysis area for this alternative.

The Richfield FO would have 436 acres (0.03 percent) of dispersed recreation area within the 250-foot-wide transmission line ROW and 16,289 acres within the 2-mile transmission line corridor. There are no identified high use areas within this acreage.

BLM SRMAs or Other Specially Managed Recreation Areas

Within the Moab FO, impacts to the Utah Rims and Labyrinth/Gemini Bridges SRMAs would be the same as under Alternative II-B. Within the Price FO, impacts to the Labyrinth SRMA would be the same as under Alternative II-B.

San Rafael Swell SRMA. Within the Price FO, approximately 180 acres of the 250-foot-wide transmission line ROW and 10,589 acres of the 2-mile transmission line corridor would fall within the 938,500-acre San Rafael Swell SRMA. These acreages comprise 0.02 percent and 1.1 percent of the SRMA, respectively. This SRMA is managed to provide sightseeing, OHV use, mountain biking, horseback riding, hiking, wildlife viewing, visiting cultural sites, camping, picnicking, photography, rock hounding, snowmobiling, and hunting opportunities. Most of the SRMA, including the more popular areas to the south, would not be affected and other day use sites and OHV routes would continue to be available during construction activities (BLM 2011e,f).

USFS Recreation Areas

Fishlake National Forest. Under Alternative II-C, 476 acres of the 250-foot-wide transmission line ROW would fall within areas classified as roaded natural within the Fishlake National Forest. The sights and sounds of construction would be in conformance with area management, though it would cause temporary adverse impacts to scenic viewers, hikers, campers and other non-motorized users identified in Section 3.13.6. Areas classified as semi-primitive motorized, while having some evidence of other users and motorized use, have a low concentration of users, and a predominantly natural or natural-appearing environment. Approximately 400 acres of the 250-foot-wide transmission line ROW and 18,887 acres of the 2-mile transmission line corridor would be located in areas classified as semi-primitive motorized. This is 46 percent of the total acreage of 2-mile transmission line corridor located within the Fishlake National Forest (40,825 acres) and 1.8 percent of all areas classified as semi-primitive motorized within the Fishlake National Forest. The total acreage within the 2-mile transmission line corridor represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Approximately 111 acres of the 2-mile transmission line corridor would be within areas classified as semi-primitive non-motorized. This is 0.06 percent of all semi-primitive non-motorized acreage within the Fishlake National Forest. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for this ROS classification. Approximately 1,151 acres of the 18,887 acres within semi-primitive motorized areas within the 2-mile transmission line corridor and 89 acres of the 111 acres within semi-primitive non-motorized areas would be located within IRAs. Roadless construction methods (see **Appendix D**) would reduce some impacts to semi-primitive motorized and non-motorized areas by eliminating road construction, but could cause a temporary adverse impact to recreationists through helicopter noise and other disturbances. The remaining 17,736 acres of semi-primitive motorized area within the 2-mile transmission line corridor would be outside the IRAs and comprises approximately 1.7 percent of all semi-primitive motorized acreage within the Fishlake National Forest. The remaining 21 acres of semi-primitive non-motorized area within the 2-mile transmission line corridor would be less than 0.01 percent of all semi-primitive non-motorized areas within the Fishlake National Forest.

Impacts to recreation in national forests from construction would be similar to those discussed under Alternative II-A. Identified high use areas within the Fishlake National Forest in Alternative II-C include the Great Western Trail, Gooseberry ATV Trail, Gooseberry-Fishlake Trail, and Great Western/Paiute ATV Trail, which is rated one of the top OHV trails in the country (Utah.com 2011b). The Great Western Trail is one of the few long distance north/south trails in this area. Temporary closure of the Great Western/Paiute ATV Trail during the summer would cause significant, inconvenient bypassing of the closures and would limit north/south travel on two of the long distance north/south trails in this area during the recreation season. Restricted access to the trail during the summer would be a substantial, but temporary adverse impact to both motorized and non-motorized user groups. Although other OHV routes would be affected in the three sections of the National Forest, there are many other similar

routes that would continue to be available for use in the National Forest during construction (USFS 2010b). Application of **REC-6** would allow access to the Great Western/Paiute Trail to continue, although there could be delays in use during key construction times.

Construction activities related to Alternative II-C would affect use of the Maple Grove picnic area and campground, which are located near the analysis area; the transmission line corridor would cross the access road to the campground. Application of **REC-6** would allow access to the Maple Grove sites to continue, although picnickers and campers may experience some delays in accessing the Maple Grove sites during key construction times. Section 3.12, Visual Resources, and **Appendix I** identify visual impacts to the area that can be viewed from the campground (KOP F-23). Application of **REC-5** would reduce impacts to campers by limiting construction on weekends and prohibiting activities on holidays or other key use times near developed recreation sites.

Project roads near the high use/developed areas listed above could result in unauthorized OHV use (and associated resource damage, noise, etc.) as well as permanent visual impacts. Please see Section 3.13.6.8 regarding potential impacts from Project access roads. Implementation of **REC-2** would limit impacts from new access roads. Operations and maintenance activities could displace wildlife, thus affecting hunting or wildlife viewing activities. Application of **REC-1** would reduce this impact by scheduling maintenance activities outside of hunting seasons. Operation of the transmission line also would affect the visual setting of recreation opportunities, although in general the line follows existing transmission lines.

State-managed Recreation Areas

WMAs. Under Alternative II-C, approximately 221 acres of the 2-mile transmission line corridor would fall within the Fillmore WMA. This comprises 1.7 percent of the WMA. The Fillmore WMA is composed of several fenced parcels managed to provide protection to big game winter range. The area is closed in winter and spring to protect wintering big game habitat. Impacts would be similar to those identified under other WMAs and would be fully eliminated or minimized through avoidance of the WMA for road construction and support area placement (**REC-2**). If road construction could not be avoided, application of **REC-4** would reduce recreation impacts by rescheduling construction activities within key hunting locales, such as WMAs, to be outside of hunting seasons.

Additionally, there is a very small portion (less than 1 acre) of the 2-mile transmission line corridor that is located within the 80-acre Emery Farm Castle Dale WMA. Impacts would be fully eliminated or minimized through avoidance of the WMA for road construction and support area placement (**REC-2**).

CWMUs. The 250-foot-wide transmission line ROW for Alternative II-C also would cross five CWMUs. The 2-mile transmission line corridor would encompass over 50 percent of the 10,558-acre Castle Valley Outdoors CWMU and the 7,975-acre Round Valley CWMU and approximately 17 percent of the 13,330-acre Johnson Mountain Ranch CWMU. Between 2 and 4 percent of the 4,670-acre Oak Ranch CWMU and the 8,165-acre Old Woman Plateau CWMU also would be within the 2-mile transmission line corridor. Impacts to hunting within the 2-mile transmission line corridor would be similar to those described above. Decisions regarding road construction and timing of construction would be up to the private landowner.

Local Recreation Areas

Cedar Ridges Golf Course. Impacts for Alternative II-C would be the same as those described under Alternative II-B for the Cedar Ridges Golf Course.

Scenic Backways and Byways

Wedge Overlook/Buckhorn Drive Scenic Backway. The 250-foot-wide transmission line ROW for Alternative II-C would parallel several portions of the Wedge Overlook/Buckhorn Drive Scenic

Backway, crossing the Backway five times. Approximately nine miles of the Backway would be within the 2-mile transmission line corridor. The visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving on portions of the Backway. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the Backway (KOPs P-9 and P-10). During construction, scenic drivers using the Backway would be subject to views of transmission line and access road construction and could experience traffic delays on portions of the Backway used for employee commute. Wire installation across the road would cause temporary delays in traffic.

Gooseberry-Fremont Road Scenic Backway. The 250-foot-wide transmission line ROW for Alternative II-C also would cross the Gooseberry-Fremont Road Scenic Backway about 3 miles south of its terminus at US 70/SR 6 and would parallel an existing transmission line. Approximately 2 miles of the Backway would be within the 2-mile transmission line corridor. During construction, scenic drivers using the Backway would be subject to views of transmission line and access road construction. Drivers also could experience additional traffic on portions of the Backway used for employee commute. Wire installation across the road would cause temporary delays in traffic. Operation of the transmission line could affect the visual setting for scenic drivers, although there is an existing transmission line along this portion of the Backway. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the Backway (KOPs Rich-14 and Rich-15).

Dinosaur Diamond Prehistoric Byway. Impacts to the Dinosaur Diamond Prehistoric Byway would be similar to those described under Alternative II-B because the two alternatives largely share the same route.

Section 3.12, Visual Resources, contains additional information regarding impacts to Scenic Byways and Backways.

Alternative II-D

Alternative II-D would cross dispersed recreation areas in five FOs and three national forests (including several developed recreation sites), three specially managed recreation areas, and three WMAs. Alternative II-D also would affect four scenic byways and two backways.

BLM Dispersed Recreation Areas

Within the White River and Fillmore FOs, the route for Alternative II-D largely shares the same corridor as Alternative II-A. Impacts to dispersed recreation within these two FOs would be similar to those described under Alternative II-A. Acreages are shown on **Table 3.13-23**.

Within the Vernal FO, the 250-foot-wide transmission line ROW for Alternative II-D would impact 2,337 acres of dispersed recreation area. The 2-mile transmission line corridor, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 89,284 acres of dispersed recreation area. These figures comprise 0.2 percent and 5.7 percent of acreage available for dispersed recreation in the FO, respectively. Within the Price FO, the 250-foot-wide transmission line ROW for Alternative II-D would impact 186 acres of dispersed recreation area and the 2-mile transmission line corridor would encompass 10,385 acres of dispersed recreation area. These figures comprise 0.01 percent and 0.8 percent of acreage available for dispersed recreation in the FO, respectively. Alternative II-D would cross the Green River at a location that has been identified as suitable for inclusion as “scenic” into the WSR system (see Section 3.15, Special Designations, for more information about compatibility with this designation). However, the more popular area for river recreation is the Desolation Canyon area, located downstream. Other high use recreational areas include Nine Mile Canyon and vacation home areas near Argyle Canyon. Within the Richfield FO, the 250-foot-wide transmission line ROW for Alternative II-D would impact 41 acres of dispersed

recreation area and the 2-mile transmission line corridor would encompass 1,574 acres of dispersed recreation activities (0.1 percent of the dispersed recreation area within the FO). Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the access road to Sand Wash, the boating put-in for Desolation Canyon (KOP V-44), Nine Mile Canyon (V-45) and Argyle Canyon (V-46).

BLM SRMAs or Other Specially Managed Recreation Areas

Fantasy Canyon and Nine Mile Canyon SRMAs. Within the Vernal FO, the 2-mile transmission line corridor would cross approximately 54 acres of the 69-acre Fantasy Canyon SRMA. This area, which comprises 78 percent of the SRMA, represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Construction would adversely affect self-guided tours and hiking areas within the SRMA. The 2-mile transmission line corridor would cross approximately 1,456 acres of the 44,168-acre Nine Mile Canyon SRMA. This area, which comprises 3 percent of the SRMA, is managed to protect high-value cultural tourism and high scenic quality for user groups such as recreational drivers and hikers. The 2-mile transmission line corridor would be located up above the rim, within oil and gas development areas and away from highly scenic areas and cultural resources; however, hikers and sightseers travelling through this area or recreating in this area would still be temporarily adversely affected by noise from construction activity within the 250-foot-wide transmission line ROW. Application of **REC-2** within these SRMAs would minimize this impact by limiting access to existing roads within the SRMA and/or requiring full reclamation of any roads that are constructed.

Little Sahara RA. Within the Fillmore FO, impacts to the Little Sahara RA would be the same as described under Alternative II-A.

USFS Recreation Areas

Ashley National Forest. Under Alternative II-D, approximately 11 acres of the 250-foot-wide transmission line ROW and 4,143 acres of the 2-mile transmission line corridor would fall within the Ashley National Forest. Over 90 percent of the 250-foot-wide transmission line ROW would fall exclusively within areas classified as roaded natural. These types of areas are managed for recreation in ways that allow for readily evident to moderate evidence of the sights and sounds of human activity. The sights and sounds of construction would be in conformance with area management, though construction would cause temporary adverse impacts to scenic viewers, hikers, campers and other non-motorized users identified in Section 3.13.6.

Approximately 2,629 acres within the 2-mile transmission line corridor would be located in areas classified as semi-primitive motorized. This is 64 percent of the total acreage of the 2-mile transmission line corridor located within the Ashley National Forest (4,143 acres) and comprises 0.9 percent of all semi-primitive motorized acreage within the Ashley National Forest. The total acreage within the 2-mile transmission line corridor represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Approximately 630 acres of the 2-mile transmission line corridor would be within areas classified as semi-primitive non-motorized. This acreage comprises 0.2 percent of all semi-primitive non-motorized acreage within the Ashley National Forest. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for these areas. Over 99 percent of the 2-mile transmission line corridor acreage within semi-primitive motorized areas (or 2,623 acres) and 100 percent of the 630 acres within semi-primitive non-motorized areas would be located within IRAs. Roadless construction methods (see **Appendix D**) would reduce some impacts to semi-primitive motorized and non-motorized areas by eliminating road construction, but could cause a temporary adverse impact to recreationists through additional noise and disturbances. The remaining 5 acres of semi-primitive motorized areas within the 2-mile transmission line corridor would not be located in IRAs and comprises approximately less than 0.01 percent of all semi-primitive motorized acreage within the Ashley National Forest.

As discussed in Section 3.13.6, construction would adversely affect hunters and wildlife watcher user groups through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Construction also would adversely affect the non-mechanized user group (hikers, campers, and equestrians) that recreate in this area through construction activity and noise. The 2-mile transmission line corridor would cross areas where adjacent UDWR deer hunting units abut (units 10 and 11). During construction, wildlife may be displaced to areas that are not within the unit for which hunters are licensed. Unit 10 is a limited entry unit. The limited entry nature of this unit is such that it would be difficult to find a substitute hunting opportunity if wildlife were displaced from the unit. Application of mitigation measures **REC-2**, **REC-4**, and **REC-5** would assist in reducing impacts within this hunting unit during both construction and operation.

Construction would affect recreation use particularly on Saturdays (there will be no construction on Sundays) and during the summer at higher elevation areas, and during the spring and fall at lower elevations. Hunters would be adversely impacted only if construction activities were scheduled during active hunting seasons. Recreationists seeking wildlife watching experiences or natural settings would be adversely impacted by these activities regardless of their timing. There are no identified high use recreational areas within the portions of the Ashley National Forest affected by Alternative II-D and in general, there are other nearby locations that visitors could temporarily go during construction activities that offer the same recreation opportunities in a similar environment. Operation of the transmission line could affect the visual setting of dispersed recreation opportunities, but in general the transmission line follows existing transmission lines. Operation and maintenance activities could displace wildlife, affecting hunting or wildlife viewing activities. Application of mitigation measure **REC-1** would assist in reducing impacts to hunting by scheduling vegetation maintenance activities outside of big game hunting seasons.

Manti-La Sal National Forest. Under Alternative II-D, approximately 173 acres of the 250-foot-wide transmission line ROW would fall within areas classified as roaded natural within the Manti-La Sal National Forest. The sights and sounds of construction would be in conformance with management goals of these areas, though construction would cause temporary adverse impacts to scenic viewers, hikers, campers and other non-motorized users identified in Section 3.13.6. Approximately 77 acres of the 250-foot-wide transmission line ROW would be located in areas classified as semi-primitive motorized. The 2-mile transmission line corridor for Alternative II-D, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 11,055 acres within the Ashley National Forest, 34 percent of which (3,727 acres) would be located in areas classified as semi-primitive motorized. This acreage comprises 0.5 percent of all semi-primitive motorized acreage within the Manti-La Sal National Forest. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for these areas. Approximately 15 percent (or 574 acres) of the acreage in semi-primitive motorized areas would be located within IRAs. Roadless construction methods (see **Appendix D**) would reduce some impacts to semi-primitive motorized areas by eliminating road construction, but could cause a temporary adverse impact to recreationists through additional noise and disturbances. The remaining 3,153 acres of semi-primitive motorized areas would not be located in IRAs and comprises approximately 0.4 percent of all semi-primitive motorized acreage within the Manti-La Sal National Forest.

Impacts to recreation from construction would be similar to those discussed under Alternative II-A. Identified high use areas within the Manti-La Sal National Forest include the North Skyline Winter Staging Area, the Gooseberry Campground, Flat Canyon Campground, Boulger Reservoir, Electric Lake Reservoir, and Wasatch Academy. The North Skyline Winter Staging Area and Gooseberry Campground would be located within the 2-mile transmission line corridor and less than 0.5 miles from the 250-foot-wide transmission line ROW. The Wasatch Academy would be about a mile from the 250-foot-wide transmission line ROW. Small portions of Flat Canyon Campground, Boulger Reservoir, and Electric Lake Reservoir areas would be within the 2-mile transmission line corridor. Use of all of these

sites would be affected by construction noise and activities as visitors may choose to visit other locations or different portions of the reservoirs to avoid construction activities. Non-motorized users, including campers and hikers would be affected by construction noise and activities. Wasatch Academy is used year-round, but is most heavily used in the spring and fall when students participate in activities such as hiking, biking, skiing, snowboarding, snowshoeing, and other activities. Academy students and use of the Academy facilities would adversely be affected by construction noise and activities and Academy students would not have a substitute building location to use for Academy activities.

Operation of the transmission line would affect the visual setting of dispersed recreation opportunities. Project roads near the high use/developed areas listed above could result in unauthorized OHV use (and associated resource damage, noise, etc.) as well as permanent visual impacts. Please see Section 3.13.6.8 regarding potential impacts from Project access roads. Application of **REC-2**, **REC-5**, and **REC-6** would assist in reducing impacts to use of these high use areas and impacts to non-motorized users from construction and operation by limiting access to existing roads, closing or rehabilitating new access roads, limiting construction times, and ensuring access to high use areas and trails is not impeded. Operations and maintenance activities could displace wildlife, thus affecting hunting or wildlife viewing activities. Application of **REC-1** would reduce this impact by scheduling maintenance activities outside of hunting seasons. Application of **REC-7** would reduce impacts to the Academy by scheduling construction to minimize disturbance to students:

REC-7*: Construction shall be scheduled to occur when the fewest students are at Wasatch Academy.*

Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility in this area (KOPs Rich-22—26, P-49 and P-50).

Uinta National Forest. Approximately 48 acres of the 2-mile transmission line corridor would fall exclusively within areas classified as roaded modified and roaded natural within the Uinta National Forest. These types of areas are managed for recreation in ways that allow for readily evident to moderate evidence of the sights and sounds of human activity. The sights and sounds of construction would be in conformance with area management, though construction would cause temporary adverse impacts to scenic viewers, hikers, campers and other non-motorized users identified in Section 3.13.6. In general, there are other nearby locations that visitors could temporarily go during construction activities that offer the same recreation opportunities in a similar environment. Operation of the transmission line could affect the visual setting of dispersed recreational opportunities, but in general the line follows existing transmission lines. Maintenance activities could displace wildlife, affecting hunting or wildlife viewing activities. Outside of scenic byways (discussed separately, below), there are no identified high use areas identified within the 2-mile transmission line corridor in Uinta National Forest.

Other Federal Recreation Areas

Impacts to the Dinosaur National Monument from Alternative II-D would be the same as those described under Alternative II-A.

State-managed Recreation Areas

WMAs. The 250-foot-wide transmission line ROW for Alternative II-D would cross the Gordon Creek WMA, Northwest Manti WMA – Hilltop Unit and the South Nebo WMA – Triangle Ranch Unit, affecting 155 acres, 17 acres and 61 acres in these WMAs, respectively. These acreages vary between 0.7 and 1.6 percent of the WMAs total acreages. These WMAs are managed for the protection of critical big game winter range. The Northwest Manti WMA – Hilltop Unit and South Nebo WMA – Triangle Ranch Unit are closed to public access in winter and spring to protect wintering wildlife. Adherence to timing restrictions during both construction and operation phases would prevent disturbance to wintering big game; however, there would still be some loss of big game habitat through vegetation removal, noise

and human activity. Alternative II-D within the WMAs primarily would affect hunting and wildlife watching recreation opportunities. The 2-mile transmission line corridor, which represents the maximum area that could be temporarily removed from use as wildlife habitat or hunting activities due to surface disturbance, increased noise, and human activity, would encompass substantial portions of the WMAs:

- Gordon Creek WMA: 5,315 acres (23.4 percent of total WMA acreage);
- Northwest Manti WMA – Hilltop Unit: 696 acres (64.8 percent of total WMA acreage); and
- South Nebo WMA – Triangle Ranch Unit: 3,584 acres (72.9 percent of total WMA acreage).

Agreements for the Gordon Creek WMA and South Nebo WMA – Triangle Ranch Unit contain reversionary clauses on some parcels if land use changes from "big game management." The Northwest Manti WMA – Hilltop Unit prohibits utilities, unless such structures or systems are necessary for permitted ranching operations or residential use. Development of a transmission line or access roads within these WMAs would not be in conformance with area management. Due to the conservation easement, application of mitigation measure **REC-8** would eliminate ground disturbance within the Hilltop Unit.

REC-8*: Due to the conservation easement, there should be no ground disturbance within the Northwest Manti WMA-Hilltop Unit.*

Habitat loss would be minimized through application of **REC-2**, which would limit access to existing roads within the WMA and/or require full reclamation of any roads that are constructed. Application of **REC-4** would reduce recreation impacts by rescheduling construction activities within key hunting locales, such as WMAs, to be outside of hunting seasons. During operations, the 250-foot-wide transmission line ROW would still have some level of vegetation maintenance during operations that could affect wildlife habitat, and maintenance-related noise could temporarily affect adjacent hunting and wildlife viewing opportunities by making the area less hospitable to wildlife. Application of **REC-1** (scheduling vegetation maintenance outside of big game hunting seasons where practicable) would further minimize impacts to hunting and wildlife viewing.

CWMUs. The 250-foot-wide transmission line ROW for Alternative II-D also would cross 63 percent (10,025 acres) of the 16,030-acre Minnie Maud Ridge CWMU and 1 percent (227 acres) of the 22,471-acre Emma Park CWMU. Impacts to hunting within the 2-mile transmission corridor area would be similar to those described above. Decisions regarding road construction and timing of construction would be up to the private landowner.

Local Recreation Areas

Big Mountain Campground. Impacts for Alternative II-D would be the same as those described under Alternative II-A for the Big Mountain Campground.

Scenic Backways and Byways

Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway. The 250-foot-wide transmission line ROW for Alternative II-D would cross the Dinosaur Diamond Prehistoric Byway near Helper, Utah and again near Dinosaur, Colorado. Impacts to the Byway from the 5-mile portion of the transmission line route near Dinosaur would be the same as under Alternative II-A because the routes are the same. The route of the transmission line near Helper would largely parallel the Byway (SR 191) north of Helper; approximately 8 miles of the Byway would fall within the 2-mile transmission line corridor. This includes the portion of the area where the Bamberger roadside monument and Castle Gate Park are located. During construction, scenic drivers using the Byway would be subject to views of transmission line and access road construction. Drivers also could experience additional traffic on portions of the Byway used for employee commute; wire installation across the road would

cause temporary delays in traffic. Operation of the line is not expected to adversely affect scenic drivers as there are already existing transmission lines along this portion of the Byway. This portion of SR 191 also is part of the Indian Canyon Scenic Byway. Impacts to the Indian Canyon Scenic Byway would be the same as described above. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visual impacts to the Byway.

Nine Mile Canyon Scenic Backway. The 250-foot-wide transmission line ROW for Alternative II-D would cross the Nine Mile Canyon Scenic Backway. Approximately 2 miles of the Backway would be within the 2-mile transmission line corridor. The crossing would be above the rim of the canyon, away from the scenic views and petroglyphs located within the canyon. There are currently no existing transmission lines in the area. Visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving on portions of the Backway nearest to the 250-foot-wide transmission line ROW; however, the proposed transmission line crossing would be located in an area of considerable oil and gas development (see Section 3.12, Visual Resources, and **Appendix I** for more information).

Energy Loop: Huntington/Eccles Canyons Scenic Byway. West of Fairview, the 250-foot-wide transmission line ROW would cross the 83-mile Energy Loop: Huntington/Eccles Canyons Scenic Byway (SR-31) several times. The route of the transmission line would largely parallel the Byway in the portion between these crossings. Approximately 17 miles of Byway would fall within the 2-mile transmission line corridor. Less than 1 mile of the Byway would fall within the 250-foot-wide transmission line ROW. There are no existing transmission lines in these areas and the 250-foot-wide transmission line ROW would not be located within any designated utility corridors. The visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving on portions of the Scenic Byway nearest to the 250-foot-wide transmission line ROW. Scenic drivers using the Byway also could be subject to views of road construction within the 2-mile transmission line corridor (see Section 3.12, Visual Resources, and **Appendix I** for more information). Visual disturbances from construction of new roads would be permanent unless fully restored. During construction, portions of the Byway also could experience additional traffic on segments used for employee commute, supply delivery, etc. (see Section 3.16, Transportation).

Skyline Drive Scenic Backway. The 250-foot-wide transmission line ROW for Alternative II-D would cross the 86-mile Skyline Drive Scenic Backway in the same area where it crosses the Energy Loop: Huntington/Eccles Canyons Scenic Byway. About 4 miles of the Backway would fall within the 2-mile transmission line corridor. Impacts would be similar to those described above. Section 3.12, Visual Resources and **Appendix I** provide additional detail regarding visibility in this area.

Nebo Loop Scenic Byway. Impacts to the Nebo Loop Scenic Byway would be the same as those described under Alternative II-A.

Alternative II-E

Alternative II-E would cross dispersed recreation areas in six FOs and three national forests (including several developed recreation sites), one specially managed recreation area, seven WMAs, and would affect small portions of several scenic byways and backways.

BLM Dispersed Recreation Areas

The route for Alternative II-E largely shares the same corridor as Alternative II-A, with the exception of the middle portion of Region II, where Alternative II-E crosses the Ashley National Forest and Manti La-Sal National Forest. On BLM lands, impacts would be similar to those described under Alternative II-A, except that the Salt Lake FO would have more acreage within the 2-mile transmission line corridor under Alternative II-E, and Alternative II-E would cross a small portion of the Price FO. There are no identified high use areas within these portions of the FOs. Acreages are shown in **Table 3.13-23**.

BLM SRMAs or Other Specially Managed Recreation Areas

Little Sahara RA. Within the Fillmore FO, impacts to the Little Sahara RA would be the same as those described under Alternative II-A.

USFS Recreation Areas

Ashley National Forest. Under Alternative II-E, 100 percent of the 250-foot-wide transmission line ROW (300 acres) within the Ashley National Forest would fall within areas classified as roaded natural. These types of areas are managed for recreation in ways that allow for readily evident to moderate evidence of the sights and sounds of human activity. The sights and sounds of construction would be in conformance with area management, though construction would cause temporary adverse impacts to scenic viewers, hikers, campers and other non-motorized users identified in Section 3.13.6. The 2-mile transmission line corridor for Alternative II-E, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 15,487 acres within Ashley National Forest. Twelve percent of this acreage (1,822 acres) would be located in areas classified as semi-primitive motorized and 5,802 acres (37 percent) would be within semi-primitive non-motorized areas. This comprises 0.6 percent and 1.6 percent of all semi-primitive motorized and semi-primitive non-motorized areas within the Ashley National Forest, respectively. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for these areas.

Approximately 100 percent (or 1,822 acres) of the semi-primitive motorized acreage and 99 percent (5,784 acres) of the semi-primitive non-motorized acreage within the 2-mile transmission line corridor would be located within IRAs. Roadless construction methods (see **Appendix D**) would reduce some impacts to semi-primitive motorized and non-motorized areas by eliminating road construction, but could cause a temporary adverse impact to recreationists through additional noise and disturbances. The remaining 18 acres of semi-primitive non-motorized area within the 2-mile transmission line corridor would be located outside IRAs and comprises less than 0.01 percent of all semi-primitive non-motorized acreage within the Ashley National Forest.

As discussed in Section 3.13.6, construction would adversely affect the hunter and wildlife viewer user group through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Construction also would adversely affect the non-mechanized users (hikers, campers, and equestrians) that recreate in this area through construction activity and noise. Recreationists seeking wildlife watching experiences or natural settings would be adversely impacted by construction activities regardless of their timing. Hunters would be adversely impacted only if these activities were scheduled during active hunting seasons. The majority of this route is well within the Hunt Unit 11 and therefore hunters' ability to track displaced game should not be affected. There are no identified high use recreational areas within the 2-mile transmission line corridor in the Ashley National Forest and in general, there are other nearby locations that visitors could temporarily go during construction activities that offer the same recreation opportunities in a similar environment. Operation of the transmission line would affect the visual setting of dispersed recreational opportunities, although in general, the line follows an existing transmission line. Operation and maintenance activities could displace wildlife, affecting hunting or wildlife viewing activities.

Uinta National Forest. Under Alternative II-E, approximately 247 acres of the 250-foot-wide transmission line ROW would fall within areas classified as roaded modified within the Uinta National Forest. The sights and sounds of construction would be in conformance with area management. The 2-mile transmission line corridor for Alternative II-E, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 10,349 acres within the Uinta National Forest. Forty-six percent of this acreage (4,752 acres) would be located in areas classified as semi-primitive motorized. This is 1.3 percent of all semi-primitive motorized acreage within the Uinta National Forest. Construction in

these areas would not be in conformance with recreation goals. Impacts to recreation from construction would be similar to those discussed under Alternative II-A. Approximately 3,581 acres of the 4,752 acres within semi-primitive motorized areas within the 2-mile transmission line corridor would be located within IRAs. Roadless construction methods (see **Appendix D**) would reduce some impacts to semi-primitive motorized areas by eliminating road construction, but could cause a temporary adverse impact to recreationists through additional noise and disturbance. The remaining 1,171 acres of semi-primitive motorized area within the 2-mile transmission line corridor would not be located in IRAs and comprises approximately 0.3 percent of the total acreage of all semi-primitive motorized areas within the Uinta National Forest. Impacts to dispersed recreation and high use areas from construction and operation would be similar to those discussed under Alternative II-A, as the route through the Uinta National Forest would be largely the same for both alternatives. The Strawberry IRA and Cedar Knoll IRA micro-siting adjustments would not substantially affect the impact analysis for recreation.

Manti-La Sal National Forest. Under Alternative II-E, approximately 30 acres of the 250-foot-wide transmission line ROW would fall within areas classified as roaded natural within the Manti-La Sal National Forest, and approximately 50 acres would be located in areas classified as semi-primitive motorized. The 2-mile transmission line corridor for Alternative II-E, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 4,859 acres within the Manti-La Sal National Forest. Of the total acreage within the 2-mile transmission line corridor, 74 percent (3,592 acres) would be located in areas classified as semi-primitive motorized, which comprises 0.5 percent of all semi-primitive motorized acreage within the Manti-La Sal National Forest. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for these areas. Approximately 60 percent of the semi-primitive motorized acreage in the 2-mile transmission line corridor (or 2,156 acres) would be located within IRAs. Roadless construction methods (see **Appendix D**) would reduce some impacts to semi-primitive motorized areas by eliminating road construction, but could cause a temporary adverse impact to recreationists through additional noise and disturbance. The remaining 1,436 acres of semi-primitive motorized area within the 2-mile transmission line corridor would not be located in IRAs and would comprise approximately 0.2 percent of all semi-primitive motorized area within the Manti-La Sal National Forest. Impacts to dispersed recreation and high use areas from construction and operation would be similar to those discussed under Alternative II-A, as the route through the Manti-La Sal National Forest would be largely the same for both alternatives.

Other Federal Recreation Areas

Impacts to the Dinosaur National Monument from Alternative II-E would be the same as those described under Alternative II-A.

State-managed Recreation Areas

WMAs. Alternative II-E would cross seven WMAs. Impacts to the North Nebo WMA – Spencer Fork Unit, Northwest Manti WMA – Birdseye/Lake Fork Unit, and Northwest Manti WMA – Lasson Draw Unit would be the same as those described under Alternative II-A. Impacts to the South Nebo WMA – Triangle Ranch Unit would be the same as those described under Alternative II-D. Additionally, the 2-mile transmission line corridor would encompass portions of the following WMAs:

- Indian Canyon WMA – Cottonwood Canyon Unit: 1,668 acres (22 percent of total WMA acreage);
- Northwest Manti WMA – Starvation Unit: 976 acres (16.9 percent of total WMA acreage); and
- Northwest Manti WMA – Dairy Fork Unit: 1,600 acres (32.2 percent of total WMA acreage).

The Indian Canyon WMA and Northwest Manti – Dairy Fork Unit are managed for big game. Hunting is a popular activity in the Indian Canyon WMA in winter, though winter vehicular use in the WMA is not encouraged. The Northwest Manti WMA—Starvation Unit is used for big game hunting and fishing and both the Starvation and Dairy Fork units are closed to public access in winter and spring to protect wintering wildlife.

Adherence to timing restrictions during both construction and operation phases would prevent disturbance to wintering big game; however, there still would be some loss of big game habitat through vegetation removal, noise and human activity. Habitat loss would be minimized through application of **REC-2**, which would limit access to existing roads within the WMA and/or require full reclamation of any roads that are constructed. Application of **REC-4** would reduce recreational impacts by rescheduling construction activities within key hunting locales, such as WMAs, to be outside of hunting seasons. During operations, the 250-foot-wide transmission line ROW would still have some level of vegetation maintenance during operations that could affect wildlife habitat, and maintenance-related noise could temporarily affect adjacent hunting, fishing, and wildlife viewing opportunities by making the area less hospitable. Application of **REC-1** (scheduling vegetation maintenance outside of big game hunting seasons where practicable) would further minimize impacts to hunting and wildlife viewing.

CWMUs. The 2-mile transmission line corridor for Alternative II-E also would cross six CWMUs. Impacts to the Crab Creek CWMU would be the same as those described under Alternative II-A. The 2-mile transmission line corridor would encompass approximately 7 percent of the 16,030-acre Minnie Maud Ridge CWMU; 32 percent of the 22,471-acre Emma Park CWMU; 38 percent of the 26,127-acre Soldier Summit CWMU; 18 percent of the 3,853-acre Antelope Creek CWMU; and less than 5 percent of the Scofield Canyons CWMU. Impacts to hunting within the CWMUs in the 2-mile corridor would be similar to those described above. Decisions regarding road construction and timing of construction would be up to the private landowner.

Local Recreation Areas

Big Mountain Campground and Bottle Hollow Reservoir. Impacts for Alternative II-E would be the same as those described under Alternative II-A for the Big Mountain Campground and Bottle Hollow Reservoir.

Camp Timberlane. The 250-foot-wide transmission line ROW would encompass 37 acres of the Church of Jesus Christ of Latter Day Saints' Camp Timberlane, while the 2-mile transmission line would encompass 381 acres or 53 percent of the site. Construction noise, activities, and visual disturbances would affect camping at this site during the summer when the camp is available. Groups, families, and individuals that use the camp may be displaced to either other campgrounds in the area or other facilities owned by the church. The camp can hold over 1,000 people and large groups may have difficulty finding a suitable substitute facility nearby. Application of **REC-2** would limit access to existing roads and/or require full reclamation of any new roads. Application of **REC-5** and **REC-6** would reduce impacts to campers by prohibiting construction during weekends and other high use periods and maintaining access to high use areas. However, construction noise and visual impacts would be present during weekdays. In addition, operation of the transmission line would permanently affect the visual setting of recreation opportunities within the camp area and maintenance operations could temporarily affect access to camp facilities and disrupt camp visitors. Section 3.17, Social and Economic Conditions, addresses the economic impacts of construction on this facility.

Scenic Backways and Byways

Under Alternative II-E, the proposed transmission line would parallel Highway 6 and existing transmission lines between Helper, Utah and Thistle, Utah. In this area, the 250-foot-wide transmission line ROW would cross the entrance to the Huntington/Eccles Canyons Scenic Byway but would be located across the highway from the entrance to the Skyline Drive Scenic Backway and the

Reservation Ridge Scenic Backway. Construction activities could cause temporary adverse effects for scenic drivers; however, byways users would quickly leave the construction area and head away from the Highway 6 corridor. Alternative II-E also would cross the Indian Canyon Scenic Byway (US191) within the Uintah and Ouray Indian Reservation; less than 2 miles of the Byway would be within the 2-mile transmission line corridor. The route would not parallel an existing transmission line in this area. Construction and operation activities would cause adverse impacts to the viewshed of the area. Impacts to the Dinosaur Diamond Prehistoric Byway would be the same as those described above for the Indian Canyon Scenic Byway portion plus those described for the 5-mile section described under Alternative II-A. Impacts to the Nebo Loop Scenic Byway would be the same as those described under Alternative II-A.

Alternative II-F (Agency Preferred)

Alternative II-F would cross dispersed recreation areas in five FOs and four national forests (including several developed recreation sites), two specially managed recreation areas, and six WMAs. Alternative II-B also would affect portions of several scenic byways.

BLM Dispersed Recreation Areas

Impacts for Alternative II-F would be the same as those discussed under Alternative II-E for the White River and Richfield FOs. Impacts for Alternative II-F would be similar to those described under Alternative II-B for the Fillmore FO and Alternative II-D for the Vernal FO; slightly more acreage would be included within the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor under Alternative II-F than the other alternatives. Impacts to dispersed recreation within the Salt Lake FO would be similar to those described for Alternative II-E; however, Alternative II-F would include more acreage within the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor. There are no high use areas identified within the analysis area for the Salt Lake FO.

BLM SRMAs or Other Specially Managed Recreation Areas

Fantasy Canyon and Nine Mile Canyon SRMAs. Impacts for Alternative II-F would be the same as those discussed under Alternative II-D for the Fantasy Canyon and Nine Mile Canyon SRMAs. These are the only two SRMAs impacted by Alternative II-F.

USFS Recreation Areas

Impacts for Alternative II-F would be the same as those discussed under Alternative II-E for the Manti-LaSal National Forest and the same as those discussed under Alternative II-B for the Fishlake National Forest. Impacts to the Ashley National Forest would be similar to those discussed under Alternative II-D, though slightly more acreage would be located within areas classified as roaded natural and semi-primitive non-motorized under Alternative II-F. Additional acreage within areas classified as semi-primitive non-motorized also would be located within IRAs. Impacts to the Uinta National Forest would be similar to those discussed under Alternative II-E though slightly more acreage would be included within areas classified as roaded natural and semi-primitive motorized under Alternative II-F. Additional acreage within areas classified as semi-primitive motorized also would be located within IRAs.

Other Federal Recreation Areas

Impacts to the Dinosaur National Monument from Alternative II-F would be the same as those described under Alternative II-A.

State-Managed Recreation Areas

WMAs. Impacts for Alternative II-F would be the same as those described under Alternative II-E for the following WMAs, which are the only ones affected by Alternative II-F:

- North Nebo WMA–Spencer Fork Unit (96.4 percent of total WMA acreage);
- Northwest Manti WMA–Birdseye/Lake Fork Unit (71.9 percent of total WMA acreage);
- Northwest Manti WMA–Dairy Fork Unit (32.2 percent of total WMA acreage);
- Northwest Manti WMA–Lasson Draw Unit (0.7 percent of total WMA acreage);
- Northwest Manti WMA–Starvation Unit (16.9 percent of total WMA acreage); and
- South Nebo WMA–Triangle Ranch Unit (72.9 percent of total WMA acreage).

CWMUs. The 2-mile transmission line corridor for Alternative II-F also would cross five CWMUs. Impacts to the Crab Creek and Scofield Canyons CWMUs would be the same as those described under Alternative II-E. The 2-mile transmission line corridor would encompass approximately 4 percent of the 16,030-acre Minnie Maud Ridge CWMU, 12 percent of the 22,471-acre Emma Park CWMU, and 21 percent of the 26,127-acre Solider Summit CWMU. Impacts to hunting within the CWMUs in the 2-mile transmission line corridor would be similar to those described above. Decisions regarding road construction and timing of construction would be up to the private landowner.

Local Recreation Areas

Big Mountain Campground and Camp Timberlane. Impacts for Alternative II-F would be the same as those described under Alternative II-A for the Big Mountain Campground and Alternative II-E for Camp Timberlane, though slightly less acreage would be within the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor under Alternative II-F for Camp Timberlane.

Scenic Backways and Byways

Impacts for Alternative II-F would be the same as those described under Alternative II-E for the Indian Canyon Scenic Byway, Nebo Loop Scenic Byway, and Skyline Drive Scenic Backway. Impacts for Alternative II-F also would be the same as those described under Alternative II-A for the Dinosaur Diamond Prehistoric Byway and the same as those described under Alternative II-D for the Nine Mile Canyon Scenic Backway.

Reservation Ridge Scenic Backway. The 2-mile transmission line corridor for Alternative II-F would encompass 13 miles or approximately 29 percent of the Reservation Ridge Scenic Backway west of Highway 191. Less than 2 miles of the 250-foot-wide transmission line ROW would include this Backway. During construction, scenic drivers using the Backway would be subject to views of transmission line and access road construction. Wire installation across the road would cause temporary delays in traffic. The visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving on portions of the Backway. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the Backway.

Alternative Variations

Emma Park Alternative Variation

Table 3.13-28 summarizes impacts associated with the use of the Emma Park Alternative Variation in Region II.

Table 3.13-28 Summary of Region II Alternative Variation Impacts to Recreation

Alternative Variation	Analysis
Emma Park Alternative Variation	Under this variation, the 2-mile transmission line corridor would affect 1,874 acres of undesignated BLM lands within the Price FO; 2,789 acres within the Salt Lake FO; and 503 acres within the Vernal FO. This is 0.1 percent or less of BLM-managed lands within each FO available for dispersed recreation. The 2-mile transmission line corridor would encompass 3 acres of the Nine Mile Canyon SRMA within the BLM Vernal FO area, approximately 0.01 percent of the SRMA area. The 2-mile transmission line corridor also would affect 2 acres within the Uinta National Forest; 62 percent of the 16,030-acre Minnie Maud Ridge CWMU; 37 percent of the 22,471-acre Emma Park CWMU; and 14 percent of the 26,127-acre Soldier Summit CWMU. Less than 1 mile of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway (along the same route) would be encompassed by the 2-mile transmission line corridor and the variation would cross the byways once at Highway 191.

Alternative Connectors in Region II

Table 3.13-29 summarizes the impacts associated with the alternative connectors in Region II. Although the Highway 191 connector would not affect any BLM or NFS lands, it would affect two scenic byways and one CWMU. The IPP East connector would impact the fewest acres of BLM lands.

Table 3.13-29 Summary of Region II Alternative Connector Impacts to Recreation

Alternative Connector	Analysis
Lynndyl Alternative Connector	Affects recreation on 11,107 acres of undesignated BLM lands within the Fillmore FO. This is 0.3 percent of BLM-managed lands within the FO available for dispersed recreation. No SRMAs are located within this connector. Also would affect 1,101 acres within the Fishlake National Forest, mostly within the Semi-primitive Motorized ROS class (0.01 percent of total acres within this class). Would affect several very short out-and-back OHV routes in the Fishlake National Forest.
IPP East Alternative Connector	Affects recreation on 1,843 acres of undesignated BLM lands within the Fillmore FO. This is 0.04 percent of BLM-managed lands within the FO available for dispersed recreation. No special recreation management areas are located within this connector.
Castle Dale Alternative Connector	Affects recreation on 2,456 acres of undesignated BLM lands within the Price FO. This is 0.2 percent of BLM-managed lands within the FO available for dispersed recreation. No special recreation management areas are located within this connector. Also would affect less than 2 miles of the Wedge Overlook/Buckhorn Drive Scenic Backway.
Price Alternative Connector	Affects recreation on 6,399 acres of undesignated BLM lands within the Price FO. This is 0.5 percent of BLM-managed lands within the FO available for dispersed recreation. No SRMAs are located within this connector. Would affect 659 acres of the 15,355-acre Hiawatha CWMU and 3,017 acres within the Gordon Creek WMA.
Highway 191 Alternative Connector	Affects 3 miles of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway and 77 acres of the Emma Park CWMU. The connector would cross the byways once (are on the same route).

Region II Conclusion

In Region II, Alternative II-A (Applicant Proposed) would affect the fewest BLM recreation areas and least amount of dispersed recreation area acreage. Alternative II-A also would affect the fewest miles of scenic byways/backways and the least amount of acreage within CWMUs, but would affect the most WMAs and a state park. All alternatives would affect some developed recreation sites within at least one national forest; Alternative II-D affects the least amount of acreage within national forests. Alternative II-C affects the least amount of acreage within WMAs.

3.13.6.11 Region III

Table 3.13-30 provides a summary of Region III recreation areas/sites by alternative, both within the 250-foot-wide transmission line ROW and 2-mile transmission corridor.

Table 3.13-30 Region III Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area/Site	Alternative III-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative III-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative III-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
BLM Fillmore FO			
Dispersed, undesignated recreation areas	2,126 (0.05%) 96,673 (2.2%)	2,096 (0.05%) 101,464 (2.3%)	2,091 (0.05%) 101,450 (2.3%)
BLM Cedar City FO			
Dispersed, undesignated recreation areas	1,256 (0.06%) 57,249 (2.7%)	1,122 (0.05%) 53,732 (2.6%)	1,122 (0.05%) 53,616 (2.5%)
BLM St. George FO			
Dispersed, undesignated recreation areas	747 (0.2%) 32,409 (6.4%)	N/A	N/A
BLM Caliente FO			
Dispersed, undesignated recreation areas	651 (0.02%) 25,917 (0.7%)	2,032 (0.06%) 81,729 (2.3%)	2,739 (0.08%) 114,595 (3.2%)
Chief Mountain SRMA	N/A	N/A	488 (0.4%) 18,618 (2%)
North Delamar SRMA	N/A	N/A	0 <1
BLM Las Vegas FO			
Dispersed, undesignated recreation areas	1,518 (0.08%) 57,488 (3.1%)	1,123 (0.06%) 38,488 (2.1%)	1,237 (0.07%) 44,147 (2.4%)
Muddy Mountains SRMA	72 (0.1%) 4,202 (3.4%)	N/A	N/A
Nellis Dunes SRMA*	N/A	N/A	0 142 (1%)
USFS Dixie National Forest			
Rural	N/A	N/A	N/A
Roaded Modified	N/A	N/A	N/A
Roaded Natural	184 (0.3%) 4,396 (8.0%)	N/A	N/A
Semi-Primitive Motorized	332 (0.3%) 9,076 (7.8%)	N/A	N/A
SPM Within IRA	*19 (0.02%)* *3,826 (3.3%)*	N/A	N/A
Remainder in SPM ROS	*313 (0.3%)* *5,250 (4.5%)*	N/A	N/A
Semi-Primitive Non-Motorized	15 (<0.01%) 10,331 (4.6%)	N/A	N/A

Table 3.13-30 Region III Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area/Site	Alternative III-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative III-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative III-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
SPNM Within IRA	*5 (<0.01%)* *9,717 (4.3%)*	*N/A*	*N/A*
Remainder in SPNM ROS	*10 (<0.01%)* *614 (0.3%)*	*N/A*	*N/A*
Private/Other	1 (<0.01%) 20 (<0.01%)	N/A	N/A
Total	**531 acres** **23,803 acres**	**N/A**	**N/A**
State Recreation Areas			
Zane CWMU	N/A	195/5,468 (55%)	195/5,468 (55%)
Scenic Byways and Backways			
Rainbow Canyon Backcountry Byway	N/A	2 crossings/5 miles	1 crossing/5 miles
Highway 93 Scenic Byway	N/A	N/A	2 crossings/15 miles
Bitter Springs Backcountry Byway	1 crossing/2 miles	N/A	N/A
Local Recreation Areas			
Newcastle Reservoir	0 40 (26%)	N/A	N/A

* Nellis Dunes SRMA is located in both Region III and Region IV. Within Region IV, there are 183 acres of this SRMA within the 2-mile transmission line corridor under all alternatives. See Region IV analysis for more information.

Alternative III-A (Applicant Proposed)

Under Alternative III-A, the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor would cross dispersed recreation areas within five FOs, one national forest, and one SRMA. A portion of the 2-mile transmission line corridor also would cross one privately managed public recreation area. Areas affected by Alternative III-A include a popular ATV area, a nationwide hiking trail, and one backcountry byway.

BLM Dispersed Recreation Areas

General construction impacts to dispersed recreation activities are described in Section 3.13.6 and include displacing visitors due to area closures, noise, or visual presence of construction, or making the area inhospitable for wildlife. Within Region III, the 250-foot-wide transmission line ROW for Alternative III-A would impact 2,126 acres of dispersed recreation area in the Fillmore FO; 1,256 acres in the Cedar City FO; 747 acres in the St. George FO; 651 acres in the Caliente FO; and 1,518 acres in the Las Vegas FO.

The 2-mile transmission line corridor for Alternative III-A, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass the following acreages of dispersed recreation area within each FO:

- Fillmore FO: 96,673 acres (2.2 percent of total available acreage for dispersed recreation within the FO).
- Cedar City FO: 57,249 (2.7 percent of total available acreage for dispersed recreation within the FO).
- St. George FO: 32,409 (6.4 percent of total available acreage for dispersed recreation within the FO).
- Caliente FO: 25,917 (0.7 percent of total available acreage for dispersed recreation within the FO).
- Las Vegas FO: 57,488 (3.1 percent of total available acreage for dispersed recreation within the FO).

As discussed in Section 3.13.6, construction impacts would have temporary adverse impacts to the hunters and wildlife viewer user groups and to non-mechanized users such as hikers or backpackers due to the direct loss of habitat from vegetation removal within the 250-foot-wide transmission line ROW and aesthetic impacts within the 2-mile transmission line corridor that would make recreation experiences in those areas undesirable or cause wildlife to leave the area. Construction would affect recreation use particularly on Saturdays (there will be no construction on Sundays), during the spring and fall when general recreation use peaks in this area, during hunting seasons, and during competitive OHV events. However, the areas affected comprise a small percentage of the FO areas and there are public lands adjacent to affected areas that can accommodate these recreation activities; except for competitive OHV events.

Within the Fillmore FO, the 250-foot-wide transmission line ROW would cross three of the four Cricket Mountain ATV trail system access roads, as well as several of the trails within the trail system. Within the Cedar City FO, Alternative III-A also would cross the American Discovery Trail (ADT) just west of Milford. The 250-foot-wide transmission line ROW would largely be within a designated utility corridor and would parallel an existing transmission line in these areas. Restricted access to the Cricket Mountain ATV trail system or the ADT during construction would be an adverse impact for recreational users of these trails. Per the PDTR (see **Appendix D**), guard structures or other safety measures would be used in areas where power lines cross railroads, roads or other public access ways during wire installation; fencing also may be used to restrict public access to work areas. Application of **REC-6** would reduce impacts to recreational users by allowing users continued access to all or part of the Cricket Mountain ATV trail system and the ADT; however, the noise and visual impacts from construction activities would still constitute an adverse effect to the recreational experience of those using the ADT. It is assumed that these construction activities would not substantively affect motorized drivers in the Cricket Mountain ATV trail system due to the noise of the motorized vehicles used on the trail system.

Alternative III-A would cross popular OHV routes near and within the Beaver Dam Wash NCA and would affect two trailheads (BLM 2011g). However, other trailheads would be available and most of the NCA would not be affected, likewise for the Beaver Dam Slope and Mormon Mesa ACECs (see Section 3.15, Special Designation Areas). Alternative III-A also would cross the Old Spanish Trail once east of Moapa and cross and parallel the trail near Highway 18 in Dixie National Forest, in addition to crossing the trail at the end of Region III (see Section 3.11, Cultural Resources and Native American Concerns, and Section 3.15, Special Designation Areas).

Within the Las Vegas FO, Alternative III-A would cross lands used for competitive OHV events on BLM land east of Nellis Dunes and southwest of the Muddy Mountains SRMA. It is assumed that impacts from noise or visual disturbances would not substantively affect recreational use of these areas or motorized drivers; however, restricted access to these areas during competitive events would be an adverse impact for recreational users in this area. The following mitigation is recommended to reduce impacts to specially permitted events:

***REC-9**: The applicant shall plan construction activities to occur outside of specially permitted event areas or times; or work with organizers to ensure adequate access and use if feasible given notice of permit timing.*

Application of this measure would successfully reduce conflicts with special events and also could result in some benefits to both parties (shared bathroom facilities, parking areas, etc.).

BLM SRMAs or Other Specially Managed Recreation Areas

Muddy Mountains SRMA. Within the Las Vegas FO, approximately 2 miles of Alternative III-A would cross the Muddy Mountains SRMA. Approximately 72 acres of the 250-foot-wide transmission line ROW and 4,202 acres of the 2-mile transmission line corridor would fall within the 123,400-acre Muddy Mountains SRMA. These acreages comprise 0.1 percent and 3.4 percent of the SRMA, respectively. This SRMA is managed to provide integrated management of wildlife habitat, cultural resources, and other recreational uses and contains both semi-primitive motorized and non-motorized (wilderness) areas. Placement of the 250-foot-wide transmission line ROW would be within the designated utility corridor and therefore consistent with recreational management goals; however, portions of the 2-mile transmission line corridor, which would contain roads and other construction facilities, would extend slightly beyond the designated utility corridor. Construction and operation of the transmission line would remove wildlife habitat and permanently alter the semi-primitive recreational setting within nearby portions of the SRMA, adversely impacting those user groups seeking a natural-appearing environment with little evidence of disturbance. Additionally, during peak construction, construction activity and noise would affect recreationists within the entire 2-mile transmission line corridor, extending the area affected to about 3.4 percent of the SRMA. Application of **REC-2** would minimize impacts by limiting access to existing roads within the SRMA and/or requiring full reclamation of any roads that are constructed. This would reduce habitat modification and fragmentation; however, 72 acres of habitat (0.1 percent of the SRMA) would still have some level of vegetation maintenance during operations that could affect hunting and wildlife viewing and result in visual impacts despite mitigation.

USFS Recreation Areas

Dixie National Forest. Under Alternative III-A, approximately 184 acres of the 250-foot-wide transmission line ROW would fall within areas classified as roaded natural within the Dixie National Forest. These types of areas are managed for recreation in ways that allow for readily evident to moderate evidence of the sights and sounds of human activity. The sights and sounds of construction would be in conformance with area management, though construction would cause temporary adverse impacts to scenic viewers, hikers, campers and other non-motorized users identified in Section 3.13.6. Areas classified as semi-primitive motorized, while having some evidence of other users and motorized use, have a low concentration of users, and a predominantly natural or natural-appearing environment. Approximately 9,076 acres within the 2-mile transmission line corridor would be located in areas classified as semi-primitive motorized. This is 38 percent of the total acreage of the 2-mile transmission line corridor within the Dixie National Forest (23,803 acres) and 7.8 percent of all semi-primitive motorized acreage within the Dixie National Forest. The total acreage within the 2-mile transmission line corridor represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity. Approximately 10,331 acres (43 percent) within the 2-mile transmission line corridor would be within areas classified as semi-primitive non-motorized. The sights and sounds of construction and presence of large construction crews and construction traffic would not be consistent with the recreation goals for this area, which comprises 4.6 percent of all semi-primitive non-motorized acreage within the Dixie National Forest. Over 42 percent of semi-primitive motorized areas (or 3,826 acres) and 94 percent (9,717 acres) of the semi-primitive non-motorized areas within the 2-mile transmission line corridor would be located within IRAs. Construction within IRAs would use roadless construction methods identified in **Appendix D**. This would reduce some impacts to semi-primitive motorized and non-motorized areas by eliminating road construction; however, helicopter construction and/or

overland travel itself also likely would be a temporary adverse impact to recreationists in these areas. The remaining 5,250 acres of semi-primitive motorized area within the 2-mile transmission line corridor would not be within IRAs and comprises approximately 4.5 percent of all semi-primitive motorized area within the Dixie National Forest. The remaining 614 acres of semi-primitive non-motorized area within the 2-mile transmission line corridor would comprise approximately 0.3 percent of all semi-primitive non-motorized area within the Dixie National Forest. Impacts to IRAs are discussed in more detail in Section 3.15, Special Designation Areas.

As discussed in Section 3.13.6, construction would adversely affect the hunters and wildlife viewer user group through habitat removal, restricted access to areas undergoing construction, and by displacing wildlife in and near construction zones. Construction would adversely affect the non-mechanized user group (hikers, campers, and equestrians) that recreate in this area due to construction activity and noise. During construction, wildlife may be displaced to areas that are not within the unit for which hunters are licensed. Hunters would be adversely impacted only if these activities were scheduled during active hunting seasons; recreationists seeking wildlife watching experiences or natural settings would be adversely impacted by construction activities regardless of their timing. Impacts would be greatest during summer and during hunting seasons. Application of **REC-1**, and **REC-2** would assist in reducing impacts to hunters and wildlife watchers, as well as reduce scenic impacts from access road construction.

High use areas within the Dixie National Forest include the area along Highway 18 near the Mountain Meadows Massacre site. Construction activities for Alternative III-A would adversely impact scenic driving along this segment of Highway 18 and visitors at this historic site would experience construction noise and visual disturbances. These impacts plus vegetation removal within the 250-foot-wide transmission line ROW would not meet the partial retention visual objectives for this area without mitigation (see Section 3.12, Visual Resources and **Appendix I** for a discussion of impacts and suggested mitigation). Application of **REC-5** would minimize impacts to recreational drivers and visitors to these sites by prohibiting construction during weekends and other high use periods in areas that are adjacent to developed recreation sites. Operation of the transmission line would have less adverse impacts to recreation users because the line would be located parallel to an existing transmission line and because the 250-foot-wide transmission line ROW would be reclaimed (see mitigation measures identified in Section 3.12, Visual Resources). Outside of this area, the area affected in the Dixie National Forest comprises a small percentage of the Dixie National Forest and there are public lands directly adjacent to affected areas that would be able accommodate the same recreation activities. Project roads could result in unauthorized OHV use (and associated resource damage, noise, etc.) as well as permanent visual impacts within dispersed recreation areas. Please see Section 3.13.6.8 regarding potential impacts from Project access roads.

State-managed Recreation Areas

There are no state-managed recreation areas within Alternative III-A.

Local Recreation Areas

Newcastle Reservoir. The 250-foot-wide transmission line ROW would cross E. Pinto Canyon Road, which is used to access Newcastle Reservoir, a popular area for fishing. TWE's guard structures and other safety measures would allow continued use of this road and access to this recreational area, although there could be some delays in traffic during peak construction times. Operation of the line is not expected to substantively affect recreational use of the reservoir because the 250-foot-wide transmission line ROW would parallel an existing transmission line in this area, resulting in minimal visual impacts to recreation users. Additionally, BMPs and other stipulations would be utilized to reduce erosion and resulting sedimentation that could affect water quality (and therefore fishing success) within the reservoir. A monument to the Jefferson Hunt party of 1849, located on Bench Road, would be within the 2-mile transmission line corridor.

Scenic Backways and Byways

Bitter Springs Backcountry Byway. The 250-foot-wide transmission line ROW for Alternative III-A would cross the Bitter Springs Backcountry Byway in the Muddy Mountains SRMA. Approximately 2 miles of the Byway would be within the 2-mile transmission line corridor. There are currently no existing transmission lines in the area; however, the transmission line would be located within a designated utility corridor. Visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving for a portion of the Byway nearest to the 250-foot-wide transmission line ROW. In addition, scenic drivers using the Byway also would be subject to views of construction within the 2-mile transmission line corridor. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility in this area.

Alternative III-B (Agency Preferred)

Under Alternative III-B, the 250-foot-wide transmission line ROW and 2-mile transmission line corridor would cross dispersed recreation areas within four BLM FOs, but would not cross any SRMAs. One backcountry byway also would be affected by Alternative III-B.

BLM Dispersed Recreation Areas

Within Region III, the 250-foot-wide transmission line ROW for Alternative III-B would impact 2,096 acres of dispersed recreation area in the Fillmore FO, 1,122 acres within the Cedar City FO, 2,032 acres within the Caliente FO, and 1,123 acres within the Las Vegas FO. Alternative III-B would not enter the St. George FO or the Dixie National Forest.

The 2-mile transmission line corridor for Alternative III-B, which represents the maximum area that could be temporarily removed from recreation use during construction due to surface disturbance, increased noise, and human activity, would encompass the following acreages of dispersed recreation area within each FO:

- Fillmore FO: 101,464 acres (2.3 percent of total available acreage for dispersed recreation within the FO).
- Cedar City FO: 53,732 acres (2.6 percent of total available acreage for dispersed recreation within the FO).
- Caliente FO: 81,729 acres (2.3 percent of total available acreage for dispersed recreation within the FO).
- Las Vegas FO: 38,488 acres (2.1 percent of total available acreage for dispersed recreation within the FO).

Impacts to dispersed recreation in the Fillmore, Cedar City, and Las Vegas FOs would be the similar to those described under Alternative III-A.

Within the Caliente FO, Alternative III-B would pass through dispersed recreation areas currently containing no existing utility lines, although the route would be partially within an existing designated corridor. Construction and operation of the transmission line would be an adverse impact to those seeking primitive recreation experiences in these portions of the FO, which includes the Clover Mountain Wilderness Area (see Section 3.15, Special Designation Areas).

BLM SRMAs or Other Specially Managed Recreation Areas

There are no SRMAs within the 2-mile transmission line corridor for Alternative III-B.

USFS Recreation Areas

There are no NFS lands within the 2-mile transmission line corridor in Alternative III-B.

State-managed Recreation Areas

Zane CWMU. The 250-foot-wide transmission line ROW for Alternative III-B would encompass about 195 acres (2 percent) of the 9,779-acre Zane CWMU. Impacts to hunting in these areas would be the same as discussed for WMAs and CWMUs within Region II. Impacts to hunting within the 2-mile transmission line corridor area would be similar to those described in Region II and would encompass over 50 percent of the CWMU. Decisions regarding road construction and timing of construction would be up to the private landowner.

Local Recreation Areas

There are no local recreation areas within Alternative III-B.

Scenic Backways and Byways

Rainbow Canyon Backcountry Byway. The 250-foot-wide transmission line ROW for Alternative III-B would cross the Rainbow Canyon Backcountry Byway twice, once on the eastern portion of the loop and once on the southern portion of the loop. Approximately 5 miles of the Byway would be within the 2-mile transmission line corridor. There currently are no existing transmission lines in the area; however, the transmission line would be located within a designated utility corridor at the farthest west Byway crossing. Visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving for a portion of the Byway nearest to the 250-foot-wide transmission line ROW. In addition, scenic drivers using the Byway also would be subject to views of construction within the 2-mile transmission line corridor. Wire installation across the road would cause temporary delays in traffic. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility in this area.

Alternative III-C

Under Alternative III-C, the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor would cross dispersed recreation areas within four FOs and one SRMA. Portions of the 2-mile transmission line corridor also would cross two additional SRMAs. Alternative III-C also would affect one scenic byway and one backcountry byway.

BLM Dispersed Recreation Areas

Within Region III, the 250-foot-wide transmission line ROW for Alternative III-C would impact 2,091 acres of dispersed recreation area in the Fillmore FO; 1,122 acres within the Cedar City FO; 2,739 acres within the Caliente FO; and 1,237 acres within the Las Vegas FO. Alternative III-C would not enter the St. George FO or the Dixie National Forest.

The 2-mile transmission line corridor for Alternative III-C, which represents the maximum area that could be temporarily removed from recreation use during construction due to surface disturbance, increased noise, and human activity, would encompass the following acreages of dispersed recreation area within each FO:

- Fillmore FO: 101,450 acres (2.3 percent of total available acreage for dispersed recreation within the FO).
- Cedar City FO: 53,616 acres (2.5 percent of total available acreage for dispersed recreation within the FO).
- Caliente FO: 114,595 acres (3.2 percent of total available acreage for dispersed recreation within the FO).
- Las Vegas FO: 44,147 acres (2.4 percent of total available acreage for dispersed recreation within the FO).

Impacts to dispersed recreation in the Fillmore, Cedar City, and Las Vegas FOs would be the same as those described under Alternative III-A.

Alternative III-C would pass through dispersed recreation areas within the Caliente FO near Caliente and south along Highway 93 and the Delamar Mountains wilderness area. Much of the affected area contains an existing transmission line. Construction and operation of the transmission line would have an adverse impact to those seeking primitive recreation experiences in these portions of the FO; especially near the Delamar Mountains wilderness area (see Section 3.15, Special Designation Areas).

BLM SRMAs or Other Specially Managed Recreation Areas

Chief Mountain SRMA. Within the Caliente FO, approximately 16 miles of Alternative III-C would cross the 111,181-acre Chief Mountain SRMA. The SRMA is managed for a variety of recreation opportunities, including rock hounding, trilobite collecting, camping, hunting, and both event-organized and casual OHV riding. The SRMA contains 413 miles of roads, OHV routes, and trails, including 39 miles of the Silver State Trail. During construction, approximately 488 acres (0.2 percent of the SRMA) would be subject to vegetation removal and other surface disturbing activities associated with transmission line construction within the 250-foot-wide transmission line ROW. The 250-foot-wide transmission line ROW would not be located within a designated utility corridor within the SRMA, nor collocated with existing transmission lines and would cross several existing OHV trails, including a portion of the Silver State Trail. Restricted access to the trail system or the Silver State Trail during construction would be an adverse impact to recreational use of the trails and to motorized drivers in this area. Other access points in the SRMA and to the Silver State Trail would remain unaffected by construction (BLM 2011h). Application of **REC-6** would reduce impacts to recreational use of the trails and to motorized drivers in this area by allowing users continued access to all or part of the trail system. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility along the Silver State Trail, trailhead, and parking area.

A total of 18,618 acres (16.7 percent of the SRMA) would be located within the 2-mile transmission line corridor. This area would include road construction and represents the maximum area that could be temporarily removed from recreation use during construction due to surface disturbance, increased noise, and human activity. It is assumed that aesthetic impacts from construction or operation of the transmission line would not substantively affect recreational use of the OHV trails or motorized drivers, due to the noise of the motorized vehicles used on the trail system; however, other user groups such as rock hounders or trilobite collectors would be adversely affected by the noise and activity. The Oak Springs trilobite site would be less than one mile from the corridor; recreationists using the picnic facilities in this area would be temporarily adversely affected by the sights and sounds of construction. Development of additional access roads within the 2-mile transmission line corridor would be an adverse impact if they restricted access to the recreational roads and trails already present in the area and also could lead to unauthorized OHV use in the area if not fully reclaimed. Application of **REC-2** would reduce the impact from road construction by limiting access within the SRMA to existing roads or requiring closure or reclamation in consultation with the BLM; however, it also is important to note that use of existing roads would be an adverse impact to recreation if construction use of the roads conflicted with recreational use of the area.

North Delamar SRMA. Less than 1 acre of the 2-mile transmission line corridor, in which roads and construction support areas could be constructed, would be located within the North Delamar SRMA. The corridor would cross near the western border of the SRMA where the route follows a designated utility corridor and existing transmission line. Application of **REC-2** and **REC-3** would eliminate impacts to this area by limiting any access within the SRMA to existing roads or requiring any new roads to be located within the exiting corridor.

Nellis Dunes SRMA. Within the Las Vegas FO, approximately 142 acres of the 2-mile transmission line corridor would be located within the Nellis Dunes SRMA. As an area of intensive OHV use, construction and operation of a transmission line is not expected to impact recreational use in this area unless access for recreation or recreational events was restricted. Application of **REC-6** and **REC-9** would reduce impacts to recreation by keeping trails open or directing users to comparable trails and scheduling construction outside of specially permitted events.

Impacts to NWRs are discussed in Section 3.15, Special Designations.

USFS Recreation Areas

There are no NFS lands within the 2-mile transmission line corridor for Alternative III-C.

State-managed Recreation Areas

Impacts to CWMUs would be the same as those described under Alternative III-B.

Local Recreation Areas

There are no local recreation areas within Alternative III-C.

Scenic Backways and Byways

Rainbow Canyon Backcountry Byway. The 250-foot-wide transmission line ROW for Alternative III-C would cross the Rainbow Canyon Backcountry Byway once near Caliente, Nevada. Approximately 5 miles of the Byway would be within the 2-mile transmission line corridor. There currently are no existing transmission lines in the area. Visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving for a portion of the Byway nearest to the 250-foot-wide transmission line ROW. In addition, scenic drivers using the Byway also would be subject to views of construction within the 2-mile transmission line corridor. Wire installation across the road would cause temporary delays in traffic. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility in this area.

Highway 93 Scenic Byway. The 250-foot-wide transmission line ROW would cross the Highway 93 Scenic Byway twice west of Caliente, Nevada, within the Chief Mountain SRMA. Approximately 15 miles of the Byway would be within the 2-mile transmission line corridor. There currently are no existing transmission lines in the area. Visual disturbances created by the transmission line itself would permanently alter the recreation setting for scenic driving for a portion of the Byway nearest to the 250-foot-wide transmission line ROW. In addition, scenic drivers using the Byway also would be subject to views of construction within the 2-mile transmission line corridor. Wire installation across the road would cause temporary delays in traffic. Section 3.12, Visual Resources, and **Appendix I** provide additional detail regarding visibility in this area.

West of Caliente, the 250-foot-wide transmission line ROW would cross the Silver State Backcountry Byway within the Chief Mountain SRMA. Impacts to this Byway (the Silver State Trail) are included in Chief Mountain SRMA analysis.

Alternative Variations in Region III

Table 3.13-31 provides a comparison of impacts associated with the alternative variations in Region III.

Table 3.13-31 Summary of Region III Alternative Variation Impacts to Recreation

Alternative Variation	Analysis
Ox Valley East Alternative Variation (Alternative III-A)	250-foot-wide transmission line ROW would cross 205 acres of NFS lands; 2-mile transmission line corridor would cross 6,526 acres of NFS lands. Avoids Alternative III-A impacts to scenic driving and viewing the Mountain Meadows Massacre site along Highway 18 in Dixie National Forest and would reduce crossings of the Old Spanish Trail; however, this variation would cross several trails within the Ox Valley ATV Trail system and would largely parallel route FS 007. Restricted access to the trail system would be an adverse impact to motorized drivers in this area and would affect use of the trail; application of **REC-6** would reduce this impact.
Ox Valley West Alternative Variation (Alternative III-A)	250-foot-wide transmission line ROW would cross 15 acres of BLM lands, 196 acres of NFS lands; 2-mile transmission line corridor would cross 29 acres of BLM lands and 2,233 acres of NFS lands. Avoids Alternative III-A impacts to scenic driving and viewing the Mountain Meadows Massacre site along Highway 18 in Dixie National Forest and would reduce crossings of the Old Spanish Trail; however, this variation would cross several trails within the Ox Valley ATV Trail system and would largely parallel route FS 007. Restricted access to the trail system would be an adverse impact to motorized drivers in this area and would affect use of the trail; application of **REC-6** would reduce this impact.
Pinto Variation (Alternative III-A)	250-foot-wide transmission line ROW would cross 628 acres of NFS lands and 205 acres of BLM land; 2-mile transmission line corridor would cross 25,296 acres of NFS lands and 5,506 acres of BLM land. Avoids impacts to scenic driving and viewing the Mountain Meadows Massacre site along Highway 18 in Dixie National Forest and would reduce crossings of the Old Spanish Trail. Avoids crossing the access road to Newcastle Reservoir, but 2-mile transmission line corridor would encompass 111 acres near the southern and western portions of the reservoir. The route would cross FR 009 and/or parallel FR 011 along Pinto Creek, with permanent adverse impacts to the scenic viewshed of visitors driving recreationally on this route, recreating near the community of Pinto or those that have vacation or second homes in the area. The Pinto Variation also would impact fishing use of and anglers at the Baker Dam (BLM) and Santa Clara River (USFS) Fishing Access recreation sites. Application of **REC-5** would minimize impacts to the community of Pinto and anglers at the two fishing access sites by prohibiting construction during weekends and other high use periods.

Alternative Connectors in Region III

Table 3.13-32 provides a comparison of impacts associated with alternative connectors in Region III. Both connectors would affect recreation on undesignated BLM lands, primarily OHV use.

Table 3.13-32 Summary of Region III Alternative Connector Impacts to Recreation

Alternative Connector	Analysis
Avon Alternative Connector	Affects recreation on 4,383 acres of undesignated BLM lands within the Cedar City FO. This is 0.2 percent of BLM-managed lands within the FO available for dispersed recreation. No special recreation management areas are located within this connector.
Moapa Alternative Connector	Affects recreation on 11,538 acres of undesignated BLM lands within the Las Vegas FO. This is 0.6 percent of BLM-managed lands within the FO available for dispersed recreation. No special recreation management areas are located within this connector.

Alternative Ground Electrode Systems in Region III

All seven alternative configurations for the ground electrode system would affect undesignated BLM lands adjacent to the Mormon Mesa ACEC. The Meadow Valley II alternative would have the greatest

impact on dispersed recreation opportunities such as hunting, camping and OHV use because of the distance from the corridor compared to the other alternatives that have shorter transmission line lengths and smaller site footprints. The Mormon Mesa-Carp Elgin Road, Halfway Wash-Virgin River, and Halfway Wash East alternatives would impact dispersed recreation uses, including very popular OHV trails, and would reduce OHV trail mileage available for use by the public during construction and operation. **Table 3.13-33** provides a comparison of impacts to recreation for each alternative electrode facility location proposed near the southern terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Table 3.13-33 Summary of Region III Alternative Ground Electrode System Location Impacts to Recreation

Alternative Ground Electrode System Location	Analysis
Mormon Mesa-Carp Elgin Road (Alternative III-A)	91 acres of disturbance from construction, 19 acres from operations. Affects undesignated BLM lands adjacent to the Las Vegas FO Mormon Mesa ACEC, including very popular OHV trails.
Mormon Mesa-Carp Elgin Road (Alternative III-B)	103 acres of disturbance from construction, 26 acres from operations. Affects undesignated BLM lands adjacent to the Las Vegas FO Mormon Mesa ACEC, including very popular OHV trails.
Halfway Wash-Virgin River (Alternative III-A)	84 acres of disturbance from construction, 16 acres from operations. Affects undesignated BLM lands adjacent to the Las Vegas FO Mormon Mesa ACEC, including very popular OHV trails.
Halfway Wash-Virgin River (Alternative III-B)	93 acres of disturbance from construction, 20 acres from operations. Affects undesignated BLM lands adjacent to the Las Vegas FO Mormon Mesa ACEC, including very popular OHV trails.
Halfway Wash East (Alternative III-A)	104 acres of disturbance from construction, 26 acres from operations. Affects undesignated BLM lands adjacent to the Las Vegas FO Mormon Mesa ACEC, including very popular OHV trails.
Halfway Wash East (Alternative III-B)	102 acres of disturbance from construction, 25 acres from operations. Affects undesignated BLM lands adjacent to the Las Vegas FO Mormon Mesa ACEC, including very popular OHV trails.
Meadow Valley 2 (Alternative III-C)	174 acres of disturbance from construction, 66 acres from operations. Affects undesignated BLM lands adjacent to the Mormon Mesa ACEC as well as <1 acre within the ACEC. Impacts OHV use. This alternative affects more dispersed recreation than the other alternatives due to the longer transmission line length.

Region III Conclusion

Within Region III, Alternative III-C would affect the most recreation areas and scenic byways/ backways. Alternative III-B (Agency Preferred) would affect the fewest recreation areas. However, Alternative III-B could affect competitive events near Nellis Dunes SRMA and access to the Cricket Mountains ATV trail system and ADT; implementation of mitigation measures **REC-6** through **REC-9** would reduce impacts by maintaining access to trails and scheduling construction around specially permitted event areas or times. Therefore, with implementation of mitigation measures **REC-6** through **REC-9**, this alternative would have the least impact on recreation use, activities, and settings. In comparison, Alternative III-A (Applicant Proposed) would affect additional recreation areas, including Dixie National Forest, and would affect recreation within a popular OHV area in the St. George FO.

3.13.6.12 Region IV

Table 3.13-34 provides a summary of Region IV recreation areas/sites by alternative, both within the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor.

Table 3.13-34 Region IV Recreation Areas within the 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Recreation Area/Site	Alternative IV-A 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative IV-B 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)	Alternative IV-C 250-foot-wide ROW 2-mile Corridor Acres (% of Total Area)
BLM Las Vegas FO			
Dispersed, undesignated recreation areas	213 (0.01) 6,990 (0.4)	190 (0.01) 6,765 (0.4)	190 (0.01) 6,765 (0.4)
Nellis Dunes SRMA	0 183 (1.2)	0 183 (1.2)	0 183 (1.2)
Sunrise Mountain SRMA	330 (0.9) 11,155 (29.7)	43 (0.1) 1,825 (4.9)	43 (0.1) 1,825 (4.9)
Las Vegas Valley SRMA	296 (0.2) 8,209 (4.2)	12 (<0.01) 535 (0.3)	N/A
Nelson/Eldorado SRMA	151 (0.2) 7,871 (8.6)	107 (0.1) 3,498 (3.8)	0 29 (<0.1)
Other Federally Managed Recreation Areas			
Sloan Canyon NCA	0 2,684 (6)	N/A	N/A
Lake Mead NRA (NPS)	0 25 (<0.01)	427 (0.03) 12,871 (<1)	414 (0.03) 14,482 (<1)
Local Recreation Areas			
Clark County Wetlands Park	18 (0.6) 376 (13)	N/A	N/A
Cascata Golf Course	N/A	0 229 (53)	N/A
Bootleg Canyon	N/A	66 (2.9) 1,627 (70)	N/A
River Mountains Loop Trail	4 crossings/8 miles	8 crossings/11.2 miles	6 crossings/10.7 miles

Alternative IV-A (Applicant Proposed and Agency Preferred)

Alternative IV-A would cross dispersed recreation areas within the Las Vegas FO and Sloan Canyon NCA, four SRMAs, the Clark County Wetlands Park, and the Lake Mead NRA.

BLM Dispersed Recreation Areas

General construction impacts to dispersed recreation activities are described in Section 3.13.6 and would affect recreationists by displacing visitors due to area closures, noise or visual presence of construction, or making the area inhospitable for wildlife. Within Region IV, the 250-foot-wide transmission line ROW for Alternative IV-A would impact 213 acres of dispersed recreation acreage in the Las Vegas FO. The 2-mile transmission line corridor, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 6,990 acres of dispersed recreation areas within the Las Vegas FO. These figures represent 0.01 percent and 0.04 percent of the acreage available for dispersed recreation in the FO, respectively. Construction would affect recreation use particularly on the weekends (Saturdays; there will be no construction on Sundays) and during the spring and fall when the weather is cooler and recreation use generally is higher in this area.

Key recreation opportunities within these dispersed recreation areas include equestrian trails in the area west of River Mountains ACEC (on city trails and the western portion of the River Mountains Loop Trail), which would be subject to noise and visual disturbances during construction and could have restricted access during peak construction times. Application of **REC-5** and **REC-6** would minimize impacts to trail users by prohibiting construction during weekends and other high use periods in areas that are adjacent to developed recreation sites and allowing users continued access to all or part of the trail system during construction. Operation of the line is expected to have little impact to recreation users because the line would be located parallel to an existing transmission line and therefore compatible with the existing viewshed. In general, within undesignated areas of the FO, there are other nearby locations that visitors could temporarily go during construction activities that offer the same recreation opportunities in a similar environment as are provided in dispersed recreation areas affected by Alternative IV-A.

BLM SRMAs or Other Specially Managed Recreation Areas

Both the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for Alternative IV-A would cross three SRMAs, affecting a maximum acreage of 11,155 acres within the 37,620-acre Sunrise Mountain SRMA (29.7 percent of the SRMA), 8,209 acres within the 197,300-acre Las Vegas Valley SRMA (4.2 percent of the SRMA) and 7,871 acres within the 91,600-acre Nelson/Eldorado SRMA (8.6 percent of the SRMA). The 2-mile transmission line corridor also would encompass 183 acres (1.2 percent) of the 10,000-acre Nellis Dunes SRMA. There are no identified high use areas in the analysis area within the Las Vegas Valley and Sunrise Mountain SRMAs; impacts would be similar to those described for dispersed recreation above. The Nellis Dunes and Nelson/Eldorado SRMAs offer high use OHV areas and specially permitted competitive OHV events. As areas of mostly motorized recreation, construction and operation of a transmission line is not expected to impact recreational use in these areas unless access to trails or use areas is restricted during key use times or specially permitted events. Application of **REC-2** would reduce the impact from road construction by limiting access within the SRMAs to existing roads or requiring closure or reclamation in consultation with the BLM. Application of **REC-5**, **REC-6**, and **REC-9** would reduce impacts to recreation by prohibiting construction during high use times, keeping trails open or directing users to comparable trails, and scheduling construction outside of specially permitted events. Operation of the line is expected to have little impact to recreation users because there are already several existing transmission lines through affected portions of these SRMAs.

Other Federally Managed Recreation Areas

Lake Mead NRA. Approximately 25 acres of the 2-mile transmission line corridor for Alternative IV-A would be within the Lake Mead NRA. The Lake Mead NRA offers year-round recreational opportunities for boating, fishing, hiking, photography, picnicking and sightseeing. The portion within the 2-mile corridor is in the far northwest corner of the NRA well away from these recreational opportunities and would not affect recreational experiences within the NRA.

Sloan Canyon NCA. Impacts to the 48,000-acre Sloan Canyon NCA are discussed in Section 3.15, Special Designation Areas; however, in general, the affected portions of the NCA within the 2-mile transmission line corridor (2,684 acres or 6 percent of the NCA) would be within areas managed for semi-primitive, non-motorized recreation and are classified as VRM Class II. Construction of roads would not be consistent with recreation management goals for this area. Application of **REC-2** would eliminate road construction within the NCA; however, recreation uses and users in the area closest to the 250-foot-wide transmission line ROW would still be temporarily affected by construction noise and activity. Application of **REC-5** and **REC-6** would minimize impacts to recreational drivers and visitors to the site by prohibiting construction during weekends and other high use periods in areas that are adjacent to developed recreation sites and allowing users continued access to all or part of the trail system during construction.

Local Recreation Areas

Clark County Wetlands Park. The 250-foot-wide transmission line ROW for Alternative IV-A would cross the Las Vegas Wash and impact 18 acres within the far-east portion of Clark County Wetlands Park, a nature and wildlife habitat viewing area. The 2-mile transmission line corridor also would encompass a total of 376 acres, or about 13 percent of the 2,900 acre park. Construction noise and visual disturbances would adversely affect wildlife watchers or other user groups seeking a natural environment and could affect use of trails in this affected portion of the park. Application of **REC-6** would reduce impacts by maintaining access to the majority of the trails in this area and/or redirecting users to other nearby trails where access is not restricted.

River Mountains Loop Trail. Alternative IV-A would cross the River Mountains Loop Trail 4 times; 3 times near Lake Mead Parkway and once at Highway 93 southeast of Henderson. Eight miles of this National Recreation Trail would be located within the 2-mile transmission line corridor. Trail users (hikers, bikers, equestrians) would be adversely affected by construction noise and activity along the trail, particularly in the spring and fall when the weather is cooler and recreation use is typically higher in this area. Use of the western portion of the trail may be affected if visitors choose to use other trails during construction. Operation of the transmission line would affect the visual setting for this National Millennium Trail. There currently are existing transmission lines at the Lake Mead Parkway crossing and the Highway 93 crossing, as well as along the base of the River Mountains on the western portion of the trail loop. Application of **REC-2**, **REC-5**, and **REC-6** would assist in reducing impacts to the trail and impacts to non-motorized users from construction and operation by limiting access to existing roads, closing or rehabilitating new access roads, limiting construction times, and ensuring access to the trail is not impeded.

Alternative IV-B

Alternative IV-B would cross dispersed recreation areas within the Las Vegas FO, four SRMAs, the Lake Mead NRA, a private golf course, and Bootleg Canyon Recreation Area.

BLM Dispersed Recreation Areas

The 250-foot-wide transmission line ROW for Alternative IV-B would impact 190 acres of dispersed recreation area in the Las Vegas FO. The 2-mile transmission line corridor, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 6,765 acres of dispersed

recreation area within the Las Vegas FO. These figures represent 0.01 percent and 0.4 percent of the area available for dispersed recreation within the FO, respectively. Impacts to general dispersed recreation would be similar to those described under Alternative IV-A, but Alternative IV-B would impact only about a third of the acreage.

BLM SRMAs or Other Specially Managed Recreation Areas

Both the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for Alternative IV-B would cross three SRMAs, affecting a maximum acreage of 1,825 acres within the 37,620-acre Sunrise Mountain SRMA (4.9 percent of the SRMA), 535 acres within the 197,300-acre Las Vegas Valley SRMA (0.3 percent of the SRMA) and 3,498 acres within the 91,600-acre Nelson/Eldorado SRMA (3.8 percent of the SRMA). The 2-mile transmission line corridor also would encompass 183 acres (1.2 percent) of the 10,000-acre Nellis Dunes SRMA. Impacts would be similar to those described under Alternative IV-A, but would affect less acreage (less than 5 percent of the Las Vegas Valley and Sunrise Mountain SRMAs and about half the acreage within the Nelson/Eldorado SRMA affected by Alternative IV-A).

Other Federally Managed Recreation Areas

Lake Mead NRA. Under Alternative IV-B, approximately 427 acres (14 miles) of the 250-foot-wide transmission line ROW and 12,871 acres of the 2-mile transmission line corridor would fall within the Lake Mead NRA. These acreages comprise less than 1 percent of the federally managed lands within the NRA, but would include developed access areas and scenic driving corridors within the Boulder Basin Zone offering year-round recreational opportunities for boating, fishing, hiking, photography, picnicking and sightseeing; primarily for day use recreation. During construction, noise and construction activities would adversely impact recreational non-motorized users in this area, such as campers, picnickers, and hikers using the Bluffs Trail, Wetlands Trail, the Historic Railroad Trail, or the River Mountains Loop Trail. The campground at Las Vegas Bay and the RV park at the Boulder Harbour/Beach would both be located within sight and earshot of construction activities. The nearest campground would be located approximately 12 miles further east, on the northern shore of the Boulder “arm.” However, camping sites are limited and this location does not have any RV hookups. Additionally, the 250-foot-wide transmission line ROW would cross the access road for the boat launch and day use parking area. Restricted access to this area also would result in adverse impacts to motorized or non-motorized water-based user groups. Construction activities and noise also may affect use of the trails, campgrounds, boat launch, and day use area if visitors are displaced from these facilities. The 250-foot-wide transmission line ROW also largely parallels Lakeshore Drive within the Boulder Basin Zone. The 250-foot-wide transmission line ROW would be located primarily on the west side of the road, away from the shoreline; however, construction would affect the aesthetic quality of the drive and also would cause delays in traffic in this area. Construction would affect recreation use particularly on Saturdays (there will be no construction on Sundays). Application of **REC-2** would reduce the impact from road construction by limiting access within the Boulder Basin Zone to existing roads or requiring closure or reclamation in consultation with the NPS. Application of **REC-5** and **REC-6** would minimize impacts to recreational drivers and visitors to the site by prohibiting construction during weekends and other high use periods in areas that are adjacent to developed recreation sites and allowing users continued access to all or part of the trail system during construction. However, the visual impacts to the Class A scenery of the area would not comply with Lake Mead NRA management objectives and would result in permanent adverse impacts to the recreation setting in the area. Section 3.12, Visual Resources and **Appendix I** provide additional detail regarding visibility along the Lake Mead Boulevard Recreation Area.

Local Recreation Areas

Cascata Golf Course. Approximately 229 acres of the 431-acre Cascata Golf Course would fall within the 2-mile transmission line corridor in which roads or construction support areas could be located. This comprises about 53 percent of the property and includes almost all of the greens as well as the

club house. During construction, noise and construction activities would adversely impact the recreational setting of the golf course. There are other golf courses in nearby Boulder City that would be available for use during the construction phase (see Section 3.17, Social and Economic Conditions, for potential economic impacts of construction to the Cascata Golf Course). Application of **REC-2** would reduce the impact from road construction by limiting construction access near the golf course to existing roads or requiring closure or reclamation in consultation with the land manager. **REC-5** would minimize impacts to recreational users in the area by prohibiting construction during weekends and other high use periods in areas adjacent to developed recreation sites, but would not mitigate the long term adverse visual impacts resulting from placement of the transmission line within the area viewshed.

Bootleg Canyon. Alternative IV-B also would affect the mountain biking trails and zip line recreation opportunities in the 2,312-acre Bootleg Canyon recreation area. During construction, the 250-foot-wide transmission line ROW would affect 66 acres within this recreational area; approximately 1,627 acres of this recreational area (about 70 percent) would fall within the 2-mile transmission line corridor in which roads or construction support areas could be located. The 250-foot-wide transmission line ROW would cross several mountain bike trails and would be located less than a few hundred feet from one of the zipline platforms. There are other mountain biking trails in the general area, but not another area dedicated to mountain biking where there are so many high quality biking trails. There is a zip line in the City of Las Vegas across Fremont Street, but no known other “natural environment” zip lining opportunities in the Las Vegas/Boulder City area. Construction activities that prevent or restrict visitor’s access to ziplining or mountain biking opportunities or degrade the experience through noise and other activities in Bootleg Canyon would cause a temporary adverse impact to recreation. Application of **REC-2** would reduce impacts by the development of new roads in this area; however, it also is important to note that use of existing roads would be an adverse impact to recreation if that use conflicted with the current mountain biking recreational use of the area. Application of **REC-5** would minimize impacts to recreational users in the area by prohibiting construction during weekends and other high use periods in areas that are adjacent to developed recreation sites. During operation, the transmission line would be viewed by zipliners and those using certain mountain biking trails. Operations are assumed to have few adverse impacts for mountain bikers because they have a variety of trails to choose from and their recreational experience is based as much on the quality of the trails as it is the naturalness of the environment. However, ziplining relies heavily upon spectacular aerial views for user satisfaction; visual impacts to the areas nearest to the zipline would result in a permanent adverse impact to this user group. Section 3.12, Visual Resources and **Appendix I** provide additional detail regarding visibility in Bootleg Canyon. The following mitigation is recommended to reduce impacts to the ziplining and mountain biking recreational experience:

***REC-10**: The Applicant shall consider the view from key recreational areas in its placement of the 250-foot-wide transmission line ROW to locate the line where it best blends in with the surrounding environment, and/or is co-located with other existing transmission lines.*

Moving the reference line to minimize the number of trails affected and avoiding the zipline activity area would reduce the impact to recreation at the site, particularly if the 250-foot-wide transmission line ROW were to be located closer to the existing transmission line, which is located further down the mountain.

River Mountains Loop Trail. Alterative IV-B would cross the River Mountains Loop Trail 8 times, mostly within the Lake Mead NRA on the eastern half of the trail. Portions of the transmission line would parallel the trail in two areas. Over 11 miles of this National Recreation Trail would be located within the 2-mile transmission line corridor. Trail users (hikers, bikers, equestrians) would be adversely affected by construction noise and activity along the trail, particularly in the spring and fall when the weather is cooler and recreation use is typically higher in this area. Use of the eastern portion of the trail may be affected if visitors choose to use other trails during construction. Operation of the transmission line would affect the visual setting for this National Millennium Trail; currently, there are

only existing transmission lines in the southeastern portion of the trail loop and along Highway 93 around Boulder City. Application of **REC-2**, **REC-5**, and **REC-6** would assist in reducing impacts to the trail and impacts to non-motorized users from construction and operation by limiting access to existing roads, closing or rehabilitating new access roads, limiting construction times, and ensuring access to the trail is not impeded.

Scenic Backways and Byways

Although there are no designated National Scenic Byways or BLM-designated Scenic Byways or Backways within Region IV, the Nevada Commission on Tourism is currently facilitating the nomination of Lakeshore and Northshore Roads within Lake Mead NRA for State Scenic Byway status. The nomination is primarily honoring the scenic, cultural, and natural features found along these road corridors. Alternative IV-B would be located along Lakeshore Road within the Lake Mead NRA. Construction and operation (presence) of the transmission line would affect the scenic quality of the road and thus could affect the nomination as a Nevada Scenic Byway.

Alternative IV-C

Alternative IV-C would cross dispersed recreation areas within the Las Vegas FO, three SRMAs, and the Lake Mead NRA.

BLM Dispersed Recreation Areas

The 250-foot-wide transmission line ROW for Alternative IV-C would impact 190 acres of dispersed recreation area in the 2.4 million-acre Las Vegas FO. The 2-mile transmission line corridor, which represents the maximum area that could be temporarily removed from use during construction due to surface disturbance, increased noise, and human activity, would encompass 6,765 acres of dispersed recreation area within the Las Vegas FO. These figures represent 0.01 percent and 0.4 percent of the area available for dispersed recreation in the FO, respectively. Impacts to general dispersed recreation would be similar those described under Alternative IV-A, but Alternative IV-C would only impact about a third of the acreage of Alternative IV-A.

BLM SRMAs or Other Specially Managed Recreation Areas

Both the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for Alternative IV-C would cross the Sunrise Mountain SRMA. Impacts would be the same as those described under Alternative IV-B. The 2-mile transmission line corridor also would encompass 183 acres of the Nellis Dunes SRMA. Impacts would be the same as those described under Alternative IV-A. The 2-mile transmission line corridor also would encompass approximately 29 acres of the Nelson/Eldorado SRMA. This would have minimal impact on recreation in this area, due to the small amount of acreage that would be subject to noise and construction activity.

Other Federally Managed Recreation Areas

Lake Mead NRA. Under Alternative IV-C, approximately 414 acres (14 miles) of the 250-foot-wide transmission line ROW and 14,482 acres of the 2-mile transmission line corridor would fall within the Lake Mead NRA. Impacts would be similar in context and intensity those described under Alternative IV-B.

Black Canyon. The 2-mile transmission line corridor would include almost 1,000 acres of the Black Canyon Wilderness (see Section 3.15, Special Designation Areas). Construction of roads in this portion of the 2-mile transmission line corridor would conflict with wilderness area management; roads would need to be placed outside of wilderness boundaries. During construction, the recreation setting of scenic, undeveloped, and natural areas within and near the wilderness area would be adversely affected by noise and construction activity. Operation of the transmission line also is expected to have

permanent impacts to non-motorized user groups seeking to recreate in and near natural wilderness areas because there are no existing transmission lines in the area.

Local Recreation Areas

River Mountains Loop Trail. Alterative IV-C would cross the River Mountains Loop Trail 6 times, entirely within the Lake Mead NRA on the eastern half of the trail. Portions of the transmission line would parallel the trail in two areas. Over 10 miles of this National Recreation Trail would be located within the 2-mile transmission line corridor. Trail users (hikers, bikers, equestrians) would be adversely affected by construction noise and activity along the trail, particularly in the spring and fall when the weather is cooler and recreation use is typically higher in this area. Use of the eastern portion of the trail may be affected if visitors choose to use other trails during construction. Operation of the transmission line would affect the visual setting for this National Millennium Trail; currently, there are only existing transmission lines in the southeastern portion of the trail loop. Application of **REC-2**, **REC-5**, and **REC-6** would assist in reducing impacts to the trail and impacts to non-motorized users from construction and operation by limiting access to existing roads, closing or rehabilitating new access roads, limiting construction times, and ensuring access to the trail is not impeded.

Scenic Backways and Byways

Impacts to Lakeshore Road would be the same as those described under Alternative IV-B.

Alternative Variations in Region IV

Table 3.13-33 summarizes impacts associated with the use of the Marketplace Alternative Variation in Region IV.

Table 3.13-35 Summary of Region IV Alternative Variation Impacts to Recreation

Alternative Variation	Analysis
Marketplace Alternative Variation (Alternative IV-B)	Under this variation, 94 acres of the 250-foot-wide transmission line ROW and 2,984 acres of the 2-mile transmission line corridor would fall within the Nelson/Eldorado SRMA. This variation would have more acreage within the SRMA than Alternative IV-B: 94 acres more of 250-foot-wide transmission line ROW (which does not enter the SRMA for Alternative IV-B), and 2,836 acres more of 2-mile transmission line corridor, with correspondingly larger impacts to recreation within the SRMA through surface disturbance and temporary access restrictions. Impacts would be greatest to OHV users and other motorized user groups.

Alternative Connectors in Region IV

Table 3.13-34 summarizes impacts associated with the use of the alternative connectors in Region IV. All alternative connectors, except the Railroad Pass Alternative Connector, would affect one SRMA and the Lake Mead NRA. The Sunrise Mountain Alternative Connector is the only connector that would not affect the River Mountains Loop Trail. The River Mountains Alternative Connector also would affect Bootleg Canyon and backcountry road use in the Lake Mead NRA. The Railroad Pass Alternative Connector would affect two BLM SRMAs as well as a private golf course.

Table 3.13-36 Summary of Region IV Alternative Connector Impacts to Recreation

Alternative Connector	Analysis
Sunrise Mountain Alternative Connector	**250-foot-wide transmission line ROW:** Sunrise Mountain SRMA: 77 acres **2-mile transmission line corridor:** Sunrise Mountain SRMA: 1,284 acres Lake Mead NRA: 882 acres
Lake Las Vegas Alternative Connector	**250-foot-wide transmission line ROW:** Las Vegas Valley SRMA: 76 acres Lake Mead NRA: 42 acres **2-mile transmission line corridor:** Las Vegas Valley SRMA: 1,277 acres Lake Mead NRA: 364 acres Would affect the River Mountains Loop Trail
Three Kids Mine Alternative Connector	**250-foot-wide transmission line ROW:** Las Vegas Valley SRMA: 123 acres Lake Mead NRA: 36 acres **2-mile transmission line corridor:** Las Vegas Valley SRMA: 1,455 acres Lake Mead NRA: 441 acres Would affect the River Mountains Loop Trail
River Mountains Alternative Connector	**250-foot-wide transmission line ROW:** Las Vegas Valley SRMA: 77 acres Lake Mead NRA: 131 acres **2-mile transmission line corridor**: Las Vegas Valley SRMA: 2,143 acres Lake Mead NRA: 3,320 acres Bootleg Canyon: 291 acres Affects backcountry road use in the Lake Mead NRA and the River Mountains Loop Trail
Railroad Pass Alternative Connector (Alternatives IV-A and IV-B)	**250-foot-wide transmission line ROW:** Las Vegas Valley SRMA: 41 acres Nelson/Eldorado SRMA: 47 acres **2-mile transmission line corridor:** Cascata Golf Course: 190 acres Las Vegas SRMA: 1,009 acres Nelson/Eldorado SRMA: 1,321 acres Would affect the River Mountains Loop Trail

Region IV Conclusion

Though Alternative IV-B would affect the same number of recreation areas as Alternative IV-A, Alternative IV-B would have a greater impact on the River Mountains Loop Trail with a higher number of trail crossings and miles affected. Alternative IV-C would affect the fewest recreation areas, but also would have an increased impact on the River Mountains Loop Trail from Alternative IV-A due to a higher number of trail crossings and miles affected. In addition, Alternatives IV-B and IV-C would permanently affect the recreation setting of the trail in an area with no existing transmission lines. In comparison to Alternative IV-C, Alternative IV-A (Applicant Proposed, Agency Preferred) would affect additional BLM recreation areas and the Clark County Wetlands Park, would affect less NRA acreage,

and would have a lesser impact on the River Mountains Loop Trail as fewer miles would be impacted, there would be fewer trail crossings, and there are existing transmission lines along much of the trail portion that would be affected by Alternative IV-A.

3.13.6.13 Impacts to Recreation from the No Action Alternative

Under the No Action Alternative, the Project would not be constructed and current management across the analysis area would be maintained. Therefore, no construction, operation, or decommissioning impacts to recreation would occur from the Project and recreation opportunities and experiences would continue as is throughout the analysis area.

3.13.6.14 Residual Effects

Mitigation related to construction activities would reduce impacts to dispersed recreation and recreation at designated sites by maintaining public access to key recreational areas, scheduling construction around key recreational events or high use times or seasons, limiting new access road locations, and scheduling vegetation maintenance outside of big game hunting season. Residual effects from construction would consist of temporary disruption of recreation activities through noise and construction activity, and travel or access delays, particularly during non-high use times or within non-high use areas. Residual effects from operation of the transmission line itself would be the same as those described under each action alternative and would consist primarily of visual impacts from the line itself. There would be no residual effects to designated recreation areas from road development if mitigation limiting access to existing roads is applied. In cases where access road development is not fully avoided, but rather limited to existing corridors and/or subject to closure/rehabilitation, residential impacts would include wildlife habitat loss, visual impacts, and potential for unauthorized OHV use. Mitigation related to maintenance activities would reduce impacts to key hunting areas during big game hunting seasons, but would not reduce impacts to other recreational activities occurring during the rest of the year. Impacts would consist of noise and human activity that would interfere with recreational activities, especially activities relying on quiet or solitude.

3.13.6.15 Irreversible and Irretrievable Commitments of Resources

All operational impacts to recreation described above would be irretrievable until transmission line decommissioning, after which time the recreational values of the transmission line area would be fully reclaimed.

3.13.6.16 Relationship Between Local Short-term Uses and Long-term Productivity

Implementation of the project would result in the conversion of some project lands from existing recreational uses to use as ROW corridors. Long-term productivity of project lands for recreation would be largely unaffected except for areas of high visual quality. In these areas, long term productivity of lands for recreation would be impacted if the surrounding land use shifted to a more industrial use as a result of the transmission line placement.

3.14 Land Use

This section describes the existing and planned land use in the Project analysis area and provides baseline and impact information for land use, including land use plans and policies, minerals and mining, agriculture and livestock grazing, and analyzes the impacts from the construction, operation, maintenance, and decommissioning of the transmission line.

3.14.1 Regulatory Background

The Project crosses or is located near many land use types, including federal land managed by the USFS, BLM, NPS, DOE, DOD, and Bureau of Reclamation; state land; county and city land; tribal land; and private land. Depending on the specific project location, a variety of land use plans may be applicable to a given portion of the Project. The regulations that guide land development and use on public and private lands are discussed in the following section.

3.14.1.1 Land Use Plans and Policies

Based on the current locations of Project reference lines, the Project crosses 4 states, 5 national forests, 15 BLM FOs, 24 counties, and 56 communities. The BLM FOs, national forests, and counties crossed are identified in **Table 3.14-1**.

Table 3.14-1 BLM Field Offices, National Forests, and Counties Crossed by State

Land Manager	Name
Wyoming	
BLM FOs	Rawlins, Rock Springs
Counties	Carbon, Sweetwater
Colorado	
BLM FOs	Grand Junction, Little Snake, White River
Counties	Garfield, Mesa, Moffat, Rio Blanco, Routt
Communities	Craig, Carbonera
Utah	
BLM FOs	Cedar City, Fillmore, Moab, Price, Richfield, Salt Lake, St. George, Vernal
National Forests	Ashley, Dixie, Fishlake, Manti-La Sal, Uinta-Wasatch-Cache
Counties	Beaver, Carbon, Daggett, Duchesne, Emery, Grand, Iron, Juab, Millard, Sanpete, Sevier, Uintah, Utah, Wasatch, Washington
Communities	Ioka, Upalco, Pines, Rio, Thistle, Gypsum Mill, Champlin, Thompson Springs, Deseret, Elba, Floy, Sagers, Vista, Cedar, Woodside, Emery, Moore, Harding, McCornick, Red Wash, Squaw Crossing, Martin, Helper, Heiner, Wildcat, Coal City, Clear Creek, Milburn, Colton, Gilluly, Kyune, Mt. Pleasant, Mill Fork, Nephi, Sky View, Soldier Summit, Tucker, Bridgeland, Modena, Beryl, Heist, Yale Crossing, Zane
Nevada	
BLM FOs	Caliente, Las Vegas
Counties	Clark, Lincoln
Communities	Jackman, Yoacham, Horseshoe Bend, Acoma, Beaverdam, Brown, Moapa, Henderson, North Las Vegas, Boulder City, Glendale

Each of the BLM FOs, national forests, and counties listed in **Table 3.14-1** has a guiding plan or document that sets forth allowable land uses within each designated area under the jurisdiction of the governing agency. BLM RMPs applicable to the Project are listed in **Table 1-3**. National forest LRMPs applicable to the Project are listed in **Table 1-4**. For the counties and cities, the guiding land use documents include the county Master Plan, Comprehensive Plan, Land Use Plan, and/or Zoning Plan. Applicable county planning documents are listed in **Table 3.14-2**. Planning documents for the affected cities will be added once the Project reference lines have been finalized. Allowable land uses within the area covered by each RMP, LRMP, county, or city plan are typically identified within each of those plans. For proposed projects that are not compatible with current allowable uses laid out in the BLM RMPs or national forest LRMPs, it may be necessary to request a plan amendment to allow the proposed action to proceed. For proposed projects that are not compatible with county or city zoning or land use plans, a variance may be required.

Table 3.14-2 County Planning Documents

State	County	Plan Name
Wyoming	Carbon	Carbon County Comprehensive Land Use Plan (2012) Carbon County Zoning Resolution of 2003 (Amended April 2011)
	Sweetwater	Sweetwater County Comprehensive Plan (2002) Sweetwater County Zoning Resolution (2011) Sweetwater County Conservation District Land and Resource Plan and Policy (2011) Little Snake River Conservation District Land, Water and Natural Resource Management Plan (Undated)
Colorado	Garfield	Garfield County Comprehensive Plan and Land Use Map (2010)
	Mesa	Mesa County Master Plan (2011)
	Moffat	Moffat County Master Plan (2003)
	Rio Blanco	Rio Blanco County Master Plan (2011)
	Routt	Routt County Master Plan (2003) Routt County Open Lands Plan (1995)
Utah	Beaver	Beaver County General Plan (1998) Beaver County Zoning Ordinance (1993)
	Carbon	Carbon County Master Plan (1997) Natural Resource Use and Management Plan (2010) Carbon County Zoning Ordinance (2011)
	Daggett	Daggett County General Plan (2008) Daggett County Zoning Ordinance (2011)
	Duchesne	Duchesne County General Plan (2005) Duchesne County Zoning Ordinance (2012)
	Emery	Emery County General Plan (1999) Emery County Zoning Ordinance (2009)
	Grand	Grand County General Plan (2012) Grand County Land Use Code (2008)

Table 3.14-2 County Planning Documents

State	County	Plan Name
Utah (Continued)	Iron	Iron County Zoning Ordinance (2009)
	Juab	Juab County General Plan (1996) Juab County Land Use Code (2007)
	Millard	Millard County General Plan (1998) Millard County Zoning Ordinance (2011) Millard County Major Utility Corridor Map (2009a)
	Sanpete	Sanpete County General Plan (2010a) Sanpete County Land Use Ordinance (2010b) Sanpete County Resource Management Plan (2012a) Sanpete County Zoning Map (2012b)
	Sevier	Sevier County General Plan (1998) Sevier County Zoning Ordinance (2010a) Sevier County Zoning Map (2010b)
	Uintah	Uintah County General Plan (2005) Uintah County Zoning (2005)
	Utah	Utah County Land Use Plan (2010) Utah County Land Use Ordinance (2005)
	Wasatch	Wasatch County General Plan Wasatch County Land Use and Development Code (2012)
	Washington	Washington County General Plan (2012a) Washington County Zoning Code (2012b)
Nevada	Clark	Clark County Comprehensive Plan (2010) Clark County Multiple Species Habitat Conservation Plan (2000) Clark County Wetlands Master Plan Boulder City Conservation Easement Agreement (1995) Boulder City Master Plan (2009)
	Lincoln	Lincoln County Master Plan (2007) Lincoln County Public Land Plan (2010a) Lincoln County Open Space Plan (2011) Southeast Lincoln County Habitat Conservation Plan (2010b) City of Caliente Land Use Plan (2011)

3.14.1.2 Mining and Minerals

Leasable minerals are those minerals that are leased to individuals for exploration and development. The leasable minerals are sub-divided into two classes: fluids and solid. Fluid minerals include oil and gas, geothermal resources and associated by-products, oil shale, native asphalt, oil impregnated sands and any other material in which oil is recoverable only by special treatment after the deposit is mined or quarried. Solid leasable minerals are specific minerals such as coal and phosphates. Leasable minerals are

associated with the following laws: Mineral Leasing Act of 1920, as amended and supplemented; Mineral Leasing Act for Acquired Lands of 1947, as amended; and the Geothermal Steam Act of 1970, as amended (American Geological Institute [AGI] 1997). Leasable minerals are acquired by applying to the federal government for a lease to explore and develop the minerals. Additional information on mining and mineral resources is found in Section 3.2, Geology.

3.14.1.3 Land Use Authorizations (Energy and ROWs)

For projects crossing state or federal land, the applicant would need to obtain a ROW grant, special use permit (SUP), easement, or other authorization. RMPs and LRMPs will commonly designate linear corridors within the boundary of the planning area for the location of existing or future transportation or utility ROWs. In addition, these planning documents often identify constrained areas where future utility ROWs will be discouraged (avoidance areas) or denied (exclusion areas). Applications for linear ROWs outside of designated corridors may require a plan amendment to expand the designated corridor to accommodate the requested ROWs. Applications for linear ROWs within BLM or USFS avoidance areas would be processed if it can be demonstrated that the proposed project and associated mitigation measures would meet the BLM RMP goals and objectives or USFS LRMP standards and guidelines for the various resources within the designated areas. Applications for linear ROWs within BLM or USFS exclusion areas would typically not be processed due to the statutory prohibitions applicable to the area in question.

In addition to the general planning documents identified above for each BLM FO or national forest, certain areas referred to as “special designation areas” (discussed in Section 3.15) also may have specific plans that pertain to the designated area. State land management agencies also may identify special designation areas. Due to the presence of sensitive resources typically present within a special designation area, the allowable land uses within these areas may be more restrictive than allowable uses in non-designated areas.

For projects that cross county or city land, the applicant would need to comply with local planning and zoning requirements and may need to apply for and obtain a conditional use permit (CUP), SUP or other permit that may be required by the local jurisdiction. For projects that cross private land, terms of the easement would need to be negotiated with each of the private land owners.

3.14.1.4 Agriculture

The Farmland Protection Policy Act (FPPA) of 1981 is intended to minimize the impact of federal programs on the conversion of farmland to nonagricultural uses. It ensures that—to the extent possible—federal programs are administered to be compatible with state and local units of government, and private programs and policies to protect farmland (NRCS 2006). Pursuant to the FPPA, farmland includes prime farmland, unique farmland, and farmland of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland.

3.14.1.5 Livestock Grazing

The Taylor Grazing Act of 1934 (43 USC 315) authorized the establishment of grazing districts and grazing privileges based on grazing capacities and priorities of use (BLM 2010, 2008). The Division of Grazing was created to administer the 142 million acres of public lands that were delineated as grazing districts. In 1946, the Division of Grazing was merged with the General Land Office to form the BLM. Section 3 of the Taylor Grazing Act gave leasing preference for grazing permits on public lands within the grazing districts to landowners and homesteaders in or adjacent to grazing district lands. Section 15 of the Taylor Grazing Act authorized leasing of public lands outside the original grazing district boundaries. In 1968, the Section 15 public lands were placed under multiple use management (43 CFR 4125.1-1). The Federal Land Policy and Management Act of 1976 (FLPMA) established policy for managing BLM-administered public lands including authorizing 10-year grazing permits, a 2-year notice of cancellation, and the development of allotment management plans.

In 1995, new livestock grazing regulations became effective that required each state BLM Director to develop standards for public land health and guidelines for livestock management (BLM 2011, 2010, 2008). While each BLM State Office developed their own standards and guidelines appropriate for the lands under their jurisdiction, the standards and guidelines focus on the four fundamentals of rangeland health outlined in the grazing regulations (43 CFR 4180.1):

1) Watersheds are functioning properly;
2) Cycling of water, nutrients, and energy in the ecosystem is occurring properly;
3) Water quality meets State standards; and
4) Special status species habitat is protected (BLM 2011).

There are six standards, primarily in terms of the physical and biological features of the landscape, which represent the minimum acceptable conditions for the rangelands. The standards are used to enhance sustainable livestock grazing and wildlife habitats while protecting watersheds and riparian ecosystems. They are observed on a landscape scale and can be measured using appropriate indicators. There are 10 guidelines that are observed on the grazing allotment and watershed level. The guidelines guide the development of management actions to protect and promote healthy rangelands. Healthy rangeland standards and guidelines apply to all multiple uses on BLM lands, including ROW reclamation.

Forest reserves were created in 1891 but with little regulation to guide their use. In 1894, in reaction to overgrazing and the deterioration of grazing lands, grazing was banned on forest reserve lands. Illegal grazing continued to occur, until 1898, when regulated grazing was permitted to occur on the forest reserves (USDA 2008). The Organic Administration Act of 1897 established that the purpose of the forest reserves was for watershed protection and timber production, and authorized grazing if it was “compatible with the safe utilization of resources” (Prevedel and Johnson 2005).

The development of a grazing permit system first occurred under the Department of the Interior in 1900 (USDA 2008). The management of the forest reserves was transferred to the Department of Agriculture and the newly created Forest Service in 1905. The permit system continued under the Forest Service management, but fees were imposed in 1906, and new allotments were established with set start and stop dates for grazing in the forest reserves. The authority of the Forest Service to issue grazing permits and charge fees was reauthorized under the Granger-Thye Act of 1950 (USDA 2008, USFS 2011). In addition, the Granger-Thye Act authorized the use of grazing receipts for range improvements and provided direction on the establishment of local grazing advisory boards (USFS 2011).

The Public Rangelands Improvement Act of 1978 provided further direction on the management of public rangeland by such measures as requiring a continuing inventory of rangeland conditions and trends, requiring that public rangeland be managed in accordance with the rangeland management objectives established through the land use planning process prescribed in FLPMA, and requiring the management of rangeland in accordance with the Taylor Grazing Act, FLPMA, and other applicable law consistent with the Act (H.R.10587). The Rescission Act of 1995 (Public Law 104-19) requires that NEPA analyses and decisions on all grazing allotments be completed on an established schedule and within a 15 year period (USFS 2011). Additional regulations concerning grazing on USFS grazing allotments are found in the main regulations and laws that direct the management of the USFS lands including the Multiple Use and Sustained Yield Act of 1960; the Forest Rangeland Resources Planning Act of 1974; and the National Forest Management Act of 1976. Regulations pertaining to grazing are outlined in Code of Federal Regulations (36 CRF 222) and include the terms and fees for a grazing permit. The Forest Service Rangeland Management Directives covers USFS policies and guidelines on rangeland management (FSM 2200 – Range Management).

3.14.1.6 Special Designation Areas

Special designation areas are units of land managed by federal or state agencies for the protection and enhancement of specific resource values. The project analysis area includes designated wilderness, WSAs, ACECs, and other special management areas (e.g., national wildlife refuges [NWRs] and national conservation areas [NCAs]). These areas, as well as IRAs and undeveloped/unroaded areas, are discussed in Section 3.15, Special Designations. Section 201 of the FLPMA also requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values, which includes wilderness characteristics. Lands with wilderness characteristics are discussed in Section 3.15, Special Designations.

3.14.2 Data Sources

Information regarding land use resources within the analysis area was obtained from a review of existing published sources, RMPs, LRMPs and applicable county land use plans. Current land use information was obtained from available GIS data, topographic maps, and internet-based tools including GoogleEarth™. A list of the land use plans that were used in the development of this section are presented in the references section. Vegetation species nomenclature is consistent with the NRCS Plants Database (NRCS 2010), unless otherwise specified.

Data sources include published maps and reports and internet websites of the USGS and UGS. Other data sources included academic and professional journals and publications. Livestock grazing allotment information was provided by the BLM FOs and USFS national forests crossed by the proposed route.

3.14.3 Analysis Area

The analysis area for land use is defined as the 2-mile transmission line corridor. Unless otherwise specified, land uses within the 250-foot-wide transmission line ROW and 2-mile transmission line corridor are described.

3.14.4 Baseline Description

The land use baseline includes an overview of existing and planned land uses, land use authorizations, agriculture, livestock grazing, and USFS management areas.

3.14.4.1 Existing and Planned Land Uses

Federal lands in the land use analysis area are managed by multiple agencies, including BLM, USFS, NPS, DOE, DOD, and Bureau of Reclamation. Major uses of Federal land include oil and gas production, military operations, forestry, agriculture, grazing, research, and recreation. Utility corridors also have been designated on Federal land throughout the analysis area. Tribal lands in the analysis area include portions of the Uinta and Ouray Indian Reservation, and the Moapa Indian Reservation. **Table 3.14-3** provides the general breakdown of land ownership within the land use analysis area; the Regional Summary found in Section 3.14.5 contains additional information.

Table 3.14-3 General Land Ownership Within the Analysis Area

Federal	Tribal	State	Private
62.7%	0.6%	5.7%	31.0%

Impacts to active areas of mineral extraction crossed by the analysis area are identified in Section 3.2, Geological, Paleontological, and Mineral Resources. Impacts to prime and unique farmland areas are described and analyzed in Section 3.3, Soils.

3.14.4.2 Land Use Authorizations (Renewable Energy and ROWs)

Projects that cross federal land must obtain ROWs and easements from the federal land manager. The Programmatic EIS for the Designation of Energy Corridors on Federal Land in the 11 Western States (DOE and BLM 2008) identified potential energy corridors (known as West-wide Energy Corridors or WWEC Corridors) on federal land for oil, gas, and hydrogen pipelines, and electricity transmission and distribution facilities. Many of the Project reference lines are located within, or parallel to, these federal energy corridors (see **Figures 2-4** through **2-7**). In areas of co-location, individual counties and BLM FOs would be consulted to ensure that the reference line will be sited as efficiently as possible to avoid the preclusion of other facilities. In addition to the WWEC corridors, additional corridors have been identified in individual BLM FO RMPs and national forest LRMPs. These locally designated corridors are considered in Section 3.14.6, Impacts to Land Use.

3.14.4.3 Agriculture

Due to the semi-arid and arid climates present in the analysis area, agricultural production is generally limited to irrigated land along the larger river valleys or in areas where sufficient supplies of groundwater are available for irrigation.

Due to the arid climate and limited water availability of the desert southwest, there is limited agricultural production within Nevada; however, the Mohawk Valley Wash north of Caliente, Nevada contains an area of irrigated pasture along the east side of U.S. Highway 93. There also are some small irrigated agricultural fields near Moapa, Nevada along the Muddy River and Meadow Valley Wash.

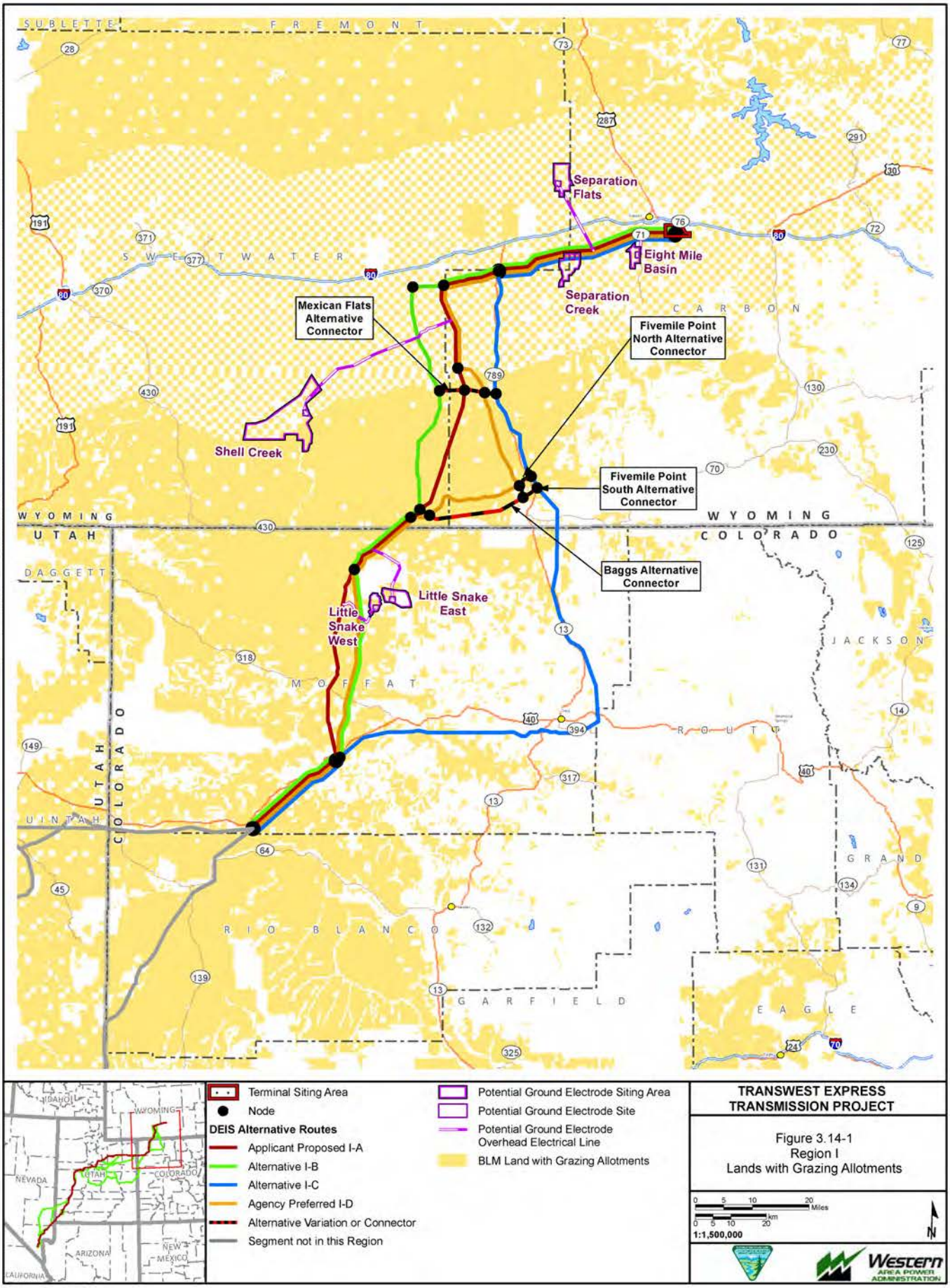
3.14.4.4 Livestock Grazing

There are 454 BLM grazing allotments, and 96 USFS grazing allotments within the analysis area. Lands with grazing allotments crossed by the Project are shown on **Figures 3.14-1** through **3.14-4**. The majority of the allotments are for cattle with fewer used for sheep and a few allotments used for horses. **Table 3.14-4** shows the total acreage of grazing allotments in the analysis area broken down by state and BLM/USFS district office.

The grazing allotments are categorized into one of three management categories: Improve (I), Maintain (M), or Custodial (C). These categories are based on present conditions, potential for improvement, other resource conflicts, and opportunities for positive economic return on public investments. An allotment can be reassigned to a different management category if resource conditions in the allotment change, or new and/or better data becomes available. The highest priority for management are allotments assigned to the "I" category.

Current management, through the implementation of the Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management, strives to prevent overgrazing, promote riparian areas, and prevent a downward trend on all grazing allotments. Actions to improve soils, vegetation, or water conditions on the allotment may include changing livestock numbers, distribution, or season of use; vegetation treatments; noxious weed control; range improvements; and implementation of livestock grazing systems such as pasture rotation or rest.

Water sources in the analysis area for livestock include intermittent, perennial, and ephemeral streams, lakes, guzzlers, and stock ponds. Range improvement data are not available for much of the analysis area. Range improvements in the analysis area can include water developments, vegetative manipulation projects and livestock management facilities. Water development improvements can include springs, livestock ponds, water troughs, guzzlers, pipelines/pipeline troughs, reservoirs, wells, raintraps, and water storage. Vegetative manipulation improvements can include seeding projects, herbicide spraying, prescribed fire, and mechanical treatments such as harrowing, chaining, contour furrowing, plowing, bull hog, and dull seeding. Management facilities can include cattle guards, fences, and corrals.


SUBLETTE
FREMONT
SWEETWATER
CARBON
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
ROUTT
JACKSON
UINTAH
GRAND
RIO BLANCO
GARFIELD
EAGLE
Separation Flats
Eight Mile Basin
Separation Creek
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Shell Creek
Fivemile Point South Alternative Connector
Baggs Alternative Connector
Little Snake East
Little Snake West
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
BLM Land with Grazing Allotments
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.14-1
Region I
Lands with Grazing Allotments
Miles
km
1:1,500,000
N
Western AREA POWER ADMINISTRATION
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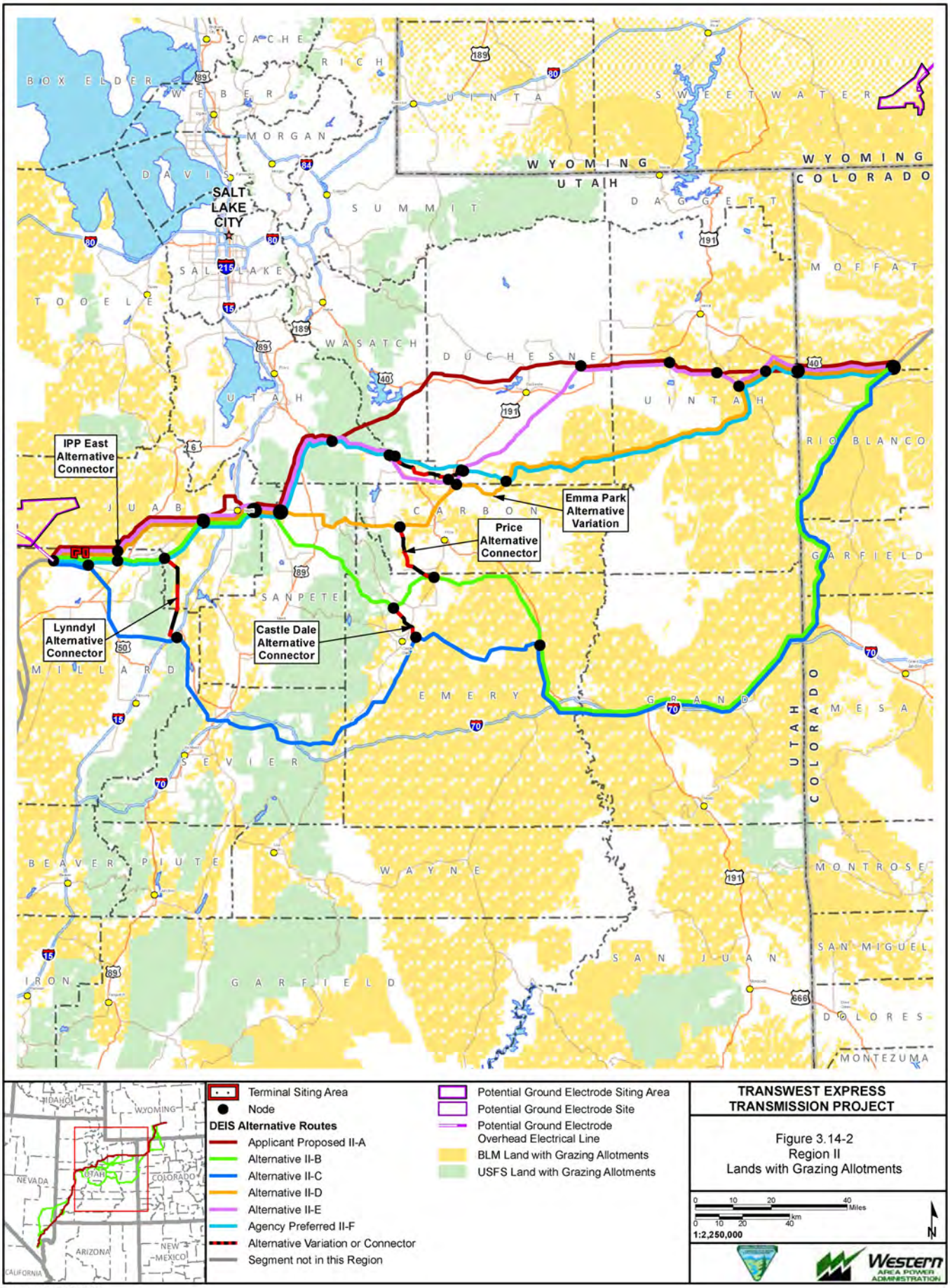

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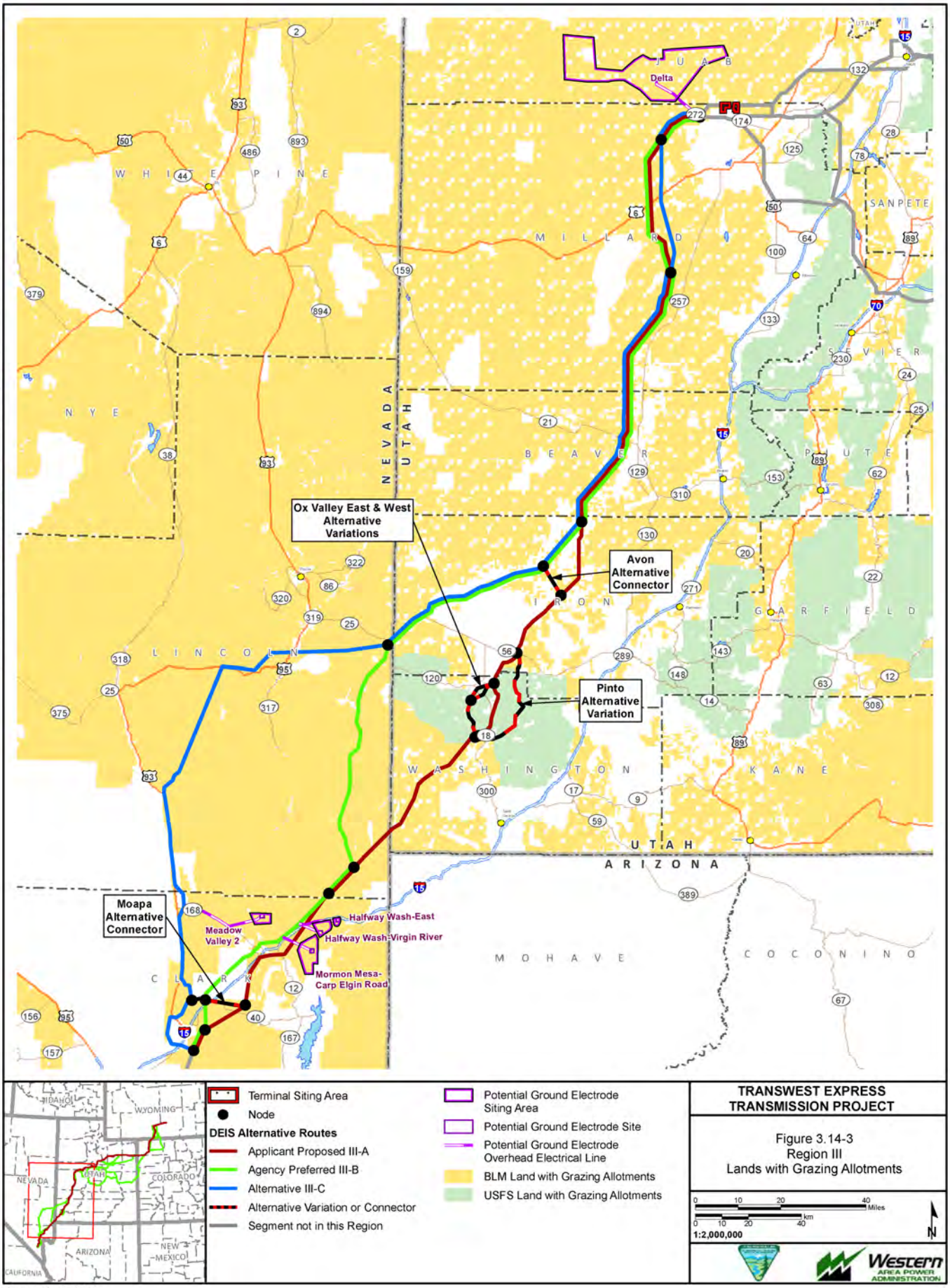

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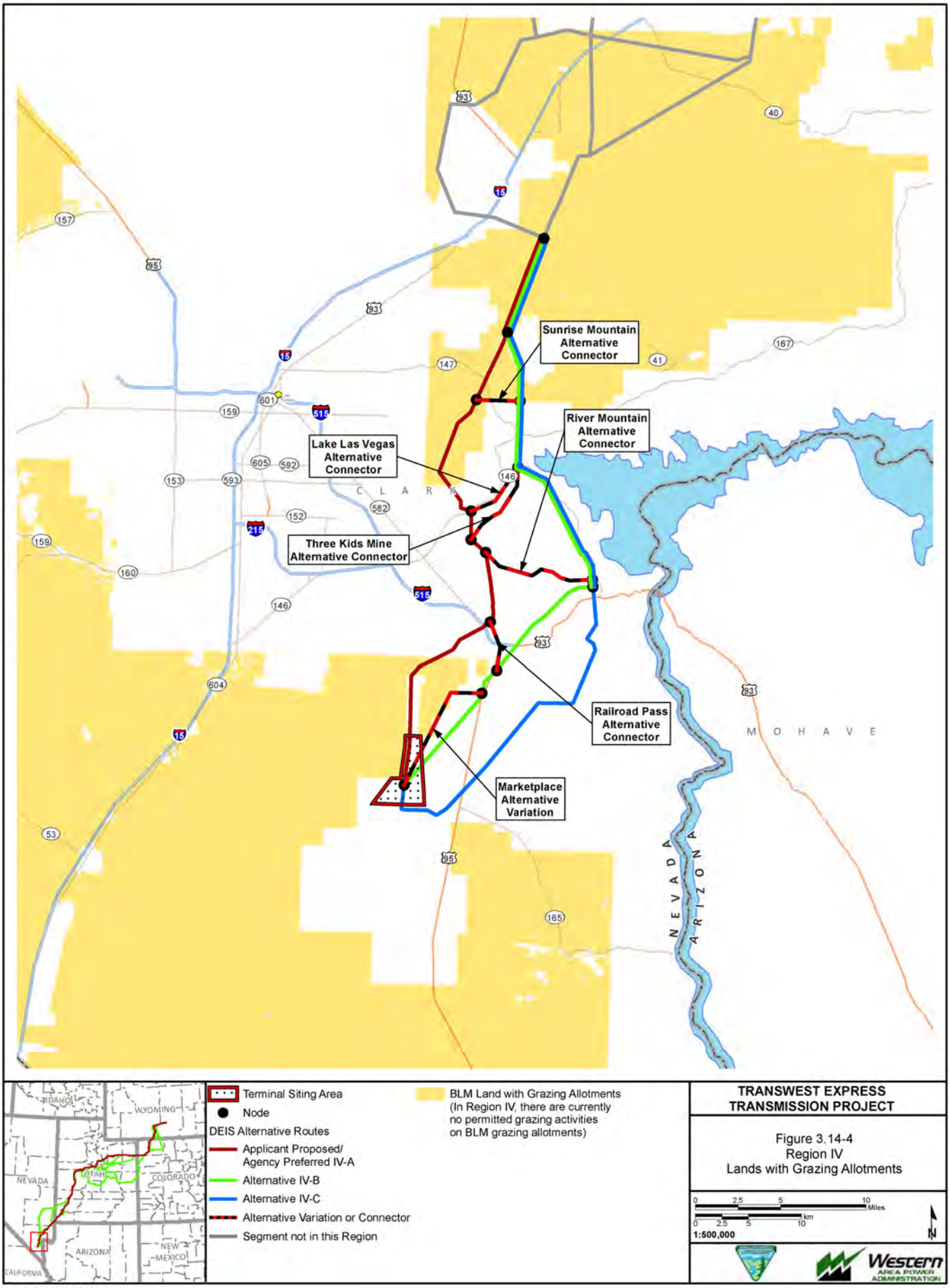

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-4
Region IV
Lands with Grazing Allotments

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Table 3.14-4 Acreage of Affected Grazing Allotments

State	BLM/USFS District Office	Grazing Allotment Acreage in Analysis Area
Wyoming	Rawlins	334,388
Colorado	Grand Junction	27,153
	Little Snake	177,378
	White River	117,861
Utah	Cedar City	183,410
	Fillmore	286,073
	Moab	93,350
	Price	241,527
	Richfield	18,840
	Salt Lake	301
	St. George	42,537
	Vernal	170,168
	Uinta-Wasatch-Cache National Forest	33,386
	Dixie National Forest	26,868
	Fishlake National Forest	48,247
	Manti-LaSal National Forest	45,673
Nevada	Ely	207,340
	Las Vegas	241,309

3.14.4.5 Cooperative Wildlife Management Units and Conservation Easements

Cooperative Wildlife Management Units (CWMUs) are hunting areas consisting of mostly private lands that have been authorized for the specific purpose of managing big game animals. There are 15 CWMUs within the Utah portions of the analysis area. Impacts to hunting within all CWMUs are discussed in further detail in Section 3.13, Recreation.

Conservation easements are legally enforceable land preservation agreements between a landowner and a government agency (municipality, county, state, federal) or a qualified land protection organization (often called a "land trust"), for the purposes of conservation. It restricts real estate development, commercial and industrial uses, and certain other activities on a property to a mutually agreed upon level. There is one identified conservation easement in Region I (Tuttle Ranch), one conservation easement in Region II (Sand Wash/Sink Draw), and three WMAs in Region II with restrictions that could preclude development of transmission lines and/or roads.

3.14.4.6 National Forest System Land Use

The analysis area includes USFS lands under the jurisdiction of five different national forests. NFS lands within the analysis area contain special managed units developed to protect resources or specific opportunities. Each forest plan (LRMP) provides direction, goals, standards, and guidelines for unit management. The Forest System Management Units within the Analysis Area are as follows:

Manti-La Sal National Forest Management Units

- General Big Game Winter Ranges
- Key Big Game Winter Range
- Developed Recreation Sites
- Minerals Management Area
- Range Forage Production
- Utility Corridor
- Wood Fiber Production and Utilization

Fishlake National Forest Management Units

- 2B Rural and Roaded-Natural Recreation Opportunities
- 4B MIS
- 5A Big Game Winter Range
- 6B Livestock Grazing
- 9F Improved Watershed Condition

Uinta National Forest Management Units

- 3.1 Aquatic, Terrestrial, and Hydrologic Resources
- 3.3 Aquatic and Terrestrial Habitat
- 4.4 Dispersed Recreation
- 4.5 Developed Recreation
- 5.2 Forested Areas – Vegetation Management
- 6.1 Non-forested Ecosystems
- 8.2 Utility Corridor/Communication Sites

Ashley National Forest Management Units

- D: Livestock Grazing
- E: Wildlife Habitat Emphasis
- F: Dispersed Recreation Roaded
- N: Existing Low Management Emphasis

Dixie National Forest Management Units

- 1 General Forest Direction
- 2b Roaded Natural Recreation
- 4c Wildlife Habitat – Brushy Range
- 5a Big Game Winter Range
- 6a Livestock Grazing

- 9a Riparian Management
- 10b Municipal Water Supply Watersheds

In addition to general forest management, each of these areas has specific standards and guidelines that would have to be met in order to be consistent with the LRMP. Compliance with many of the standards and guidelines for each area is already addressed through TransWest Design Features (see **Appendix C**, Section C.2). The additional standards and guidelines for each management area that are not addressed by TransWest Design Features are included in **Appendix C**, Section C.4.

3.14.5 Regional Summary

3.14.5.1 Land Use

A brief description of the land use by Project region is below. Land jurisdiction is summarized by Project region in **Table 3.14-5** and shown in Chapter 2.0 on **Figures 2-12** through **2-15**.

Table 3.14-5 Distribution of Jurisdiction and Land Use by Project Region within the Analysis Area (Percent)

Region	BLM	USFS	Other Federal[1]	Tribal	State	Private
I	56.9	0	0	0	7.6	35.5
II	48.4	9.2	0.01	0.1	11.7	30.6
III	76.6	2.7	0	2.3	3.3	15.1
IV	28.6	0	28.6	0	0	42.8

[1] Other Federal includes NPS, Bureau of Reclamation, DOD, and DOE.

Region I

The majority of the land within the analysis area in Region I is BLM land. Major uses of BLM land in this region include oil and gas production and grazing. The Utah portion of Region I includes grazing and oil and gas production areas. Portions of the city of Craig, Colorado, are within the analysis area. Agricultural production within Region I generally is irrigated pasture and hayland and is limited to land along the valley floors north of Baggs, Wyoming.

Region II

Approximately half of the land within the analysis area in Region II is BLM land and one-tenth is Forest Service land. This region includes the Uinta Basin, which is a major area of oil and gas development. Other major land uses include grazing, agriculture, forestry, and recreation. Region II contains a number of BLM-managed special designation areas (see Section 3.15, Special Designations) and state-managed wildlife management areas (see Section 3.13, Recreation). Utility corridors are present on public lands throughout the region. Region II also includes inventoried roadless areas in the Ashley, Uinta, Fishlake, and Manti-La Sal national forests (see Section 3.15, Special Designations). The Uinta and Ouray Indian Reservation is located within Region II analysis area. The Paiute Reservation also is located with Region II and near proposed transmission line routes; however none of the project reference lines cross lands within this reservation boundary.

Portions of the towns of Rangely, Colorado, and the Utah towns and cities of Ballard, Roosevelt City, Nephi City, and Lynndyl are included in the analysis area, including a future annexation growth area for Nephi City.

Irrigated agriculture occurs in this region in and along the major river valleys.

Region III

More than three-quarters of the land within the analysis area in Region III is BLM land and a small portion is USFS land. Major uses of BLM land within this region include military operation areas (MOAs). The area also contains special designation areas and desert tortoise conservation areas. The University of Utah operates and maintains the Telescope Array Cosmic Ray Project in Millard County. First Wind's Milford Wind Corridor (MWC) Project Phase I (Beaver County) and Phase II (Millard County) are constructed and operating. MWC Phases III and IV (Millard and Beaver counties) currently are on hold due to the expiration of production tax credits. The Fillmore FO is currently under a planning moratorium and must gain concurrence from the DOD that any actions requiring a plan amendment would not affect military readiness prior to authorizing actions within the FO.

There is some limited agricultural production on private land within the region including hog farming in areas that have available water. Within the Region III analysis area there is limited agricultural production due to the arid climate. The analysis area in Nevada only contains a few agricultural operations in Meadow Valley Wash and along the Muddy River.

Utility corridors are present throughout the region and portions of the Dixie National Forest include inventoried roadless areas. According to the USFS, the corridor passing through the Dixie National Forest is nearly full to capacity with power lines, especially with the recent addition of the Sigurd to Red Butte line. This region also includes the BLM Beaver Dam Wash National Conservation Area, the USFWS Desert National Wildlife Range/Refuge, and the Moapa Indian Reservation. There are a number of power plants and transmission lines within this region. The city of North Las Vegas falls within the analysis area. An industrial area near the Apex power plant is located within the municipal boundaries of the city of North Las Vegas and this area is zoned for heavy industrial development.

Region IV

The analysis area in this region includes portions of the eastern Las Vegas metropolitan area. Nearly one-third of the land within the analysis area in Region IV is BLM land and one-third is federal land managed by the National Park Service (Lake Mead National Recreation Area) and the Department of Energy. Major land uses include urban development in the Las Vegas metropolitan area, and recreation areas and trails associated with the conservation areas on the eastern edge of the urban area. Nellis AFB is located in the northeastern corner of the Las Vegas metropolitan area. Special designation areas within Region IV include designated wilderness, ACECs, and the Lake Mead National Recreation Area, which is managed by the National Park Service (see Section 3.13, Recreation, and Section 3.15, Special Designations). The Bureau of Reclamation also manages land within this region. The region also includes major electrical transmission corridors. The southern portion of Region IV, which is the project terminus, includes several large electrical substations and large solar power plants located in the Eldorado Valley. Within Region IV, portions of the cities of Henderson and Boulder City, and the community of Glendale are within the analysis area. A comment received during the EIS public scoping period indicated that a master planned residential and commercial community development has been proposed in the community of Glendale. There are no known areas of agricultural production in Region IV.

3.14.5.2 Grazing

As described in Section 3.14.4.4, Livestock Grazing, there are approximately 500 BLM and USFS grazing allotments found within the analysis area. Many of these grazing allotments are found over a wide geographic area within the analysis area. **Table 3.14-6** summarizes the acres of BLM and USFS grazing allotments by region within the analysis area. The acres include active and inactive grazing allotments. Grazing allotments found within each region are presented on **Figures 3.14-1** through **3.14-4**.

Table 3.14-6 Grazing Allotment Acreage by Region in Analysis Areas[1]

State	BLM/USFS District Office	Region			
		I	II	III	IV
Wyoming	Rawlins	334,338	-	-	-
Colorado	Grand Junction	-	27,153	-	-
	Little Snake	177,378	-	-	-
	White River	17,032	100,830	-	-
Utah	Cedar City	-	-	183,410	-
	Fillmore	-	137,001	149,072	-
	Moab	-	93,350	-	-
	Price	-	241,527	-	-
	Richfield	-	18,840	-	-
	Salt Lake	-	301	-	-
	St. George	-	-	42,537	-
	Vernal	-	170,168	-	-
	Uinta-Wasatch-Cache National Forest[2]	-	33,386	-	-
	Dixie National Forest[2]	-	-	26,868	-
	Fishlake National Forest[2]	-	48,247	-	-
	Manti-La Sal National Forest[2]	-	45,673	-	-
Nevada	Ely	-	-	207,340	-
	Las Vegas	-	-	157,302	84,007
Total Acres by Region		528,748	916,476	766,529	84,007

[1] Includes active and inactive grazing allotments.

[2] USFS national forest grazing allotments overlap BLM FO boundaries.

3.14.6 Impacts to Land Use

The land use impact analysis identifies the impacts to the uses of land resources (existing and planned land uses) and management of land resources from the construction, operation, and decommissioning of the Proposed Project. The analysis includes three to five alternative transmission line routes in each region and associated alternative variations and connectors, two AC/DC converter stations, and other ancillary facilities described in detail in **Appendix D**.

The impact analysis considers impacts to land resources within the applicant-proposed and alternative ROWs and within the proposed and alternative project corridors. The ROW analysis area is 250 feet wide, centered on the transmission reference line (125 feet on either side of the reference line). Quantification of impacts within the ROW generally includes either the acres of construction and operational disturbance of land from transmission facilities, or miles of a management area or land use type crossed by the transmission route reference lines.

The corridor analysis area includes land outside of the 250-foot-wide transmission line ROWs that are within approximately 2-mile corridors within which the alternative transmission route reference lines are located. As shown on **Figures 2-4** through **2-7**, some portions of the corridors are wider or narrower than 2 miles. Proposed facilities within the corridor analysis areas include access roads, staging areas, and helicopter fly yards. Structures, land uses, and management areas within the corridors that would potentially be affected by Project construction and operation generally are identified; however, specific locations of access roads

and construction disturbances within the corridors will not be identified until the development of the construction plan for the project. In addition, it is anticipated that some land uses or management areas within the corridors would be avoided as facilities are sited within the corridors. Refer to Chapter 2.0, Project Description and Alternatives, for the alternative transmission line corridors and facilities that comprise the ROW and corridor analysis areas.

Land ownership, designated utility and transportation corridors, avoidance and exclusion areas, livestock grazing allotments, and agricultural areas were identified from GIS data gathered from the USFS, the BLM, and the states of Wyoming, Colorado, Utah, and Nevada. Land use and land cover data were obtained from aerial photographs, and GIS mapping of data was obtained from federal and state agencies. Aerial photography was used to identify and verify land uses within the project corridors and ROWs.

Land use and land management data in applicable BLM, USFS, and other federal agency planning documents were used to identify potential conflicts with management objectives or conversion of existing land uses on federal lands to energy transmission facilities. Applicable BLM, USFS, and other federal agency management guidelines and objectives were reviewed to identify management and land resource conflicts from both construction and operation of the Proposed Project. Proposed Project impacts to specific physical, biological, and social (visual, socioeconomic) resources, are addressed in the appropriate resource impact sections. The availability of data and up-to-date accuracy of some land use and management data, such as land use authorizations and realty actions, was not consistent for all affected federal and state land management agencies; however, the best available data were used for this analysis.

Counties and municipalities in the analysis area have developed land use policies that are included in adopted land use plans and zoning ordinances. These local land use plans often provide data on existing and planned land uses, as well as goals, objectives, and management actions meant to guide land uses on both private and county/municipal lands. Planned land uses and zoning districts in some county plans include a ‘public’ or similar zoning designation or land use; however, the counties do not regulate uses on public lands. Zoning provides the regulatory controls through zoning districts and overlays to implement land use plan objectives. Affected zoning districts were reviewed for private lands in the analysis area to identify conflicts with allowable uses. The relevant land use and zoning data were not consistently available, and therefore not quantifiable, for all counties and municipalities in the analysis area.

Issues considered in assessing land use impacts are based on the interests and land management objectives of local and federal landowners and management agencies and public concerns identified through public scoping. These issues provided the basis of the land use impact analysis, and are summarized in **Table 3.14-7**. Grazing analysis considerations are provided in greater detail than other land resource considerations because livestock grazing is the primary use of public and private lands in the ROW and corridor analysis areas.

Table 3.14-7 Relevant Analysis Considerations for Land Use

Existing Land Use	Analysis Considerations and Relevant Assumptions
Residential and Built Environment	Consistency with local plans, ordinances, existing ROWs, and permitting requirements of counties and municipalities. Compatibility with land uses that include existing and planned residential areas, master planned communities, industrial uses.
Agriculture	Impacts to agricultural activities, ability to irrigate, and existing pivot irrigation.
Livestock grazing	Impacts to livestock grazing and pasture lands.
Reduction in AUMs and forage	Permanent surface disturbance and areas where successful reclamation is difficult would reduce the AUMs in grazing allotments.

Table 3.14-7 Relevant Analysis Considerations for Land Use

Existing Land Use	Analysis Considerations and Relevant Assumptions
Loss of, or injury to, livestock	Increases in the number of roads, vehicular traffic, and traffic speeds. An increase in the number of roads and vehicular traffic would contribute to difficulties in livestock management, and increase the potential for livestock-vehicle collisions.
Impacts to lambing	An increase in vehicular traffic, noise, and disturbance can impact lambing areas.
Energy and ROWs	Changes to land use authorizations and effects to realty actions on federal lands.
USFS Management Areas	Consistency with management area goals and objectives and Standards and Guidelines.

The methodology to determine grazing allotment acres and AUMs on rangelands that would be disturbed by the project where exact locations of new surface disturbance-related activities are unknown is described in the introduction to Chapter 3.0. The number of AUMs lost based on the surface disturbance acres was calculated based on an average ratio of 20 AUM per acre. Due to the lack of consistent data on range improvements (fences, cattle guards, stock tanks, etc.) in the project area, the discussions on impacts to range improvements are qualitative and general for each project component or region.

The impact analysis describes: 1) the impacts to land uses from construction and operation of the facilities at the Northern and Southern terminals; and 2) impacts to land uses from alternative routes in Regions I through IV.

Some land uses and land resources are evaluated in other sections of this EIS. Impacts to mineral resources are addressed in Section 3.2, Geological, Paleontological, and Mineral Resources. Impacts to recreational uses of land resources are evaluated in Section 3.13, Recreation Resources. Impacts to prime farmland and unique farmland soils are evaluated in Section 3.3, Soils. Transportation is addressed in Section 3.16, Transportation and Access. Impacts to special designation areas, including IRAs are evaluated in Section 3.15, Special Designation Areas. These land resources are not further addressed in the land use impact analysis.

3.14.6.1 Impacts from Terminal Construction, Operation, and Decommissioning

This section discloses impacts to land uses that would occur from construction and operation of the Northern and Southern terminals, which are common to all action alternatives.

Northern Terminal

The Northern Terminal site is proposed on private lands in Carbon County, Wyoming, approximately 3 miles southwest of the town of Sinclair, Wyoming. The proposed Northern Terminal facilities would occupy 234 acres of private lands within the Northern Terminal, as shown in Chapter 2.0 on **Figure 2-16**. The initial construction and permanent operations disturbance for the facilities is summarized in **Table 2-1**.

Private lands within the Northern Terminal are currently used for grazing. Other agricultural uses, such as crop production, do not occur in the Northern Terminal.

Land use on private lands in the Northern Terminal is guided by the goals, objectives, and strategies of the Carbon County Comprehensive Land Use Plan, and controlled through zoning districts. The Carbon County Comprehensive Land Use Plan has been recently updated and was adopted April 3, 2012. The Land Use Plan includes guidelines and a map that identifies future land uses in the county, including private lands located within the Northern Terminal. The future land use represents the pattern of land use and development that will best achieve the goals of the Land Use Plan. According to the Land Use Plan, the designated future land use of private land within the siting area is Agricultural Rural Living. This category is intended to accommodate a moderate density, rural land use pattern. According to the Plan, industrial uses

should be carefully sited to avoid conflicts with other land uses. The Northern Terminal is within the Ranching, Agriculture, Mining Zone (RAM) zoning district. Public facilities and utilities are limited to above-ground structures, including substations, distribution and regulator stations. Overhead electrical transmission lines over 69-kV are allowed under a CUP, subject to Carbon County Planning Commission approval (Carbon County 2011). No conflicts were identified and therefore no significant land use impact is expected.

Construction of the Northern Terminal could result in surface disturbance impacts to 504 acres (approximately 17 AUMs) on privately owned lands located within the Pine Grove/Bolten BLM livestock grazing allotment. Livestock grazing (horse and cattle) does occur on private lands in the Pine Grove/Bolten grazing allotment. However, as the terminal would be sited completely on private lands within the Northern Terminal; all impacts associated with the construction and operation of the Northern Terminal would occur to grazing on private lands and there would be no impact to grazing on public lands. Operation of the northern terminal would result in the loss of 234 acres (approximately 8 AUMs) to livestock grazing from the footprints of permanent facilities, access roads, and the construction of a perimeter fence around the Northern Terminal.

Indirect impacts to livestock grazing in the vicinity of the Northern Terminal would include the potential spread of noxious and invasive species, and the fragmentation of grazing allotments, impacts to livestock management, and the loss of access to range improvements located in the Northern Terminal (e.g., fences, gates, and water sources). Following surface-disturbing activities, noxious weeds and invasive plant species may readily spread and colonize areas that typically lack or have minimal vegetation cover or areas that have been recently disturbed. The potential conversion of native vegetative communities due to impacts from increased erosion and invasion and spread of noxious and invasive weed species would be a long-term impact.

The applicant has committed to the following design features (e.g., environmental protection measures) to minimize impacts:

- TWE-16: Site restoration and cleanup including repair or replacement of watering facilities damaged by construction.
- TWE-40: Align the ROW to reduce impacts to agriculture production as much as practical.
- TWE-43: Implement a Flagging, Fencing, and Signage Plan, which would include:
  - Replacing or repairing fences and gates damaged by construction activities
  - Installing cattle guards where permanent access roads cut through fences.
- GEN-22: Requirements for fences that are to be cut including bracing, and rebuilding of the fence to meet BLM standards.

Additional environmental protection measures that would apply to the project include the WWEC performance standards (i.e., BMPs), which are listed in **Appendix C**. Also listed in **Appendix C** are NSU and CSU restrictions for the agencies managing lands crossed by the Project.

As described in Section 3.5, Vegetation, reclamation would occur once construction is complete in temporary work areas, which would result in reestablishment of vegetation in accordance with the PDTR, BMPs, design features, and management agency or private landowner requirements.

The long-term loss of forage would not be significant relative to the overall availability of forage on affected rangeland. The temporary and permanent fragmentation of allotments as a result of construction and operation activities, and the placement of tower structures, facilities, and access roads could result in impacts to the management and use of the grazing allotments.

Therefore, the following additional mitigation measures are recommended to mitigate impacts to range resources:

RANGE-1*: Prior to construction of each segment, access road, or ancillary facility crossing a BLM or USFS grazing allotments, TWE shall coordinate with the associated BLM FO and USFS national forest concerning planned development and operations that will occur and identify potential livestock management issues. TWE will provide a schedule and locations of construction activities on affected grazing allotments to the BLM FO and USFS national forest to be provided to the affected grazing permittees. The construction activities schedule and construction activity locations shall be provided on a date early enough to allow grazing permittees sufficient time to make decisions and allocate their resources during the construction time period.*

RANGE-2*: Prior to construction of transmission line segments, access road, or ancillary facilities, active range improvement locations shall be inventoried. Based on the results of these inventories, no roads, or ancillary facilities would be placed within 200 meters of range improvements, including livestock and wildlife water sources/systems. If avoidance is not feasible, features would be relocated to an alternate location per BLM, USFS, or state wildlife agency guidance.*

RANGE-3*: Damage to livestock and livestock facilities shall be reported as quickly as possible to BLM, USFS, and affected livestock operators. If damage is caused by the construction, operation, or maintenance of this project, TWE will be financially responsible for the replacement of the livestock and/or livestock facilities.*

RANGE-4*: The Flagging, Fencing, and Signage Plan would include:*

- *Prevention measures to avoid damaging fences, gates, and cattleguards during construction and operation activities.*
- *Mitigation to prevent livestock from passing through breaks in fences as a result of construction and operation activities. Measures would include the installation of temporary gates, or cattleguards, and coordination with landowners and grazing permittees.*
- *Limit the placement of guy wires where livestock water or where they would fall in stock driveways. Shield guards would be used as appropriate.*
- *Upgrading cattleguard gate widths and load-bearing requirements as appropriate for construction and operation vehicles on access roads.*
- *Require heavy equipment to use by-pass gates to avoid damage to cattleguards.*
- *If a by-pass gate is not already in place, install a by-pass gate adjacent to existing cattleguards to prevent damage by heavy equipment.*
- *Existing cattle guards would be cleaned as determined necessary by the appropriate land management agency post-construction activities.*
- *Following construction activities any Range Improvement Projects that are damaged from construction and maintenance activities would be repaired at a minimum to pre-construction conditions.*
- *Mitigation for loss of livestock due to damaged fences and gates that were result of construction and operation activities.*
- Mitigation for loss of livestock as a result of construction and operation vehicle collisions.

RANGE-5*: If construction or operation activities disrupt the transport of water to water locations for livestock or wildlife, an alternative water source will be provided until the transport of water is resumed. Alternative*

water sources could include the hauling of water to watering locations, an alternate pipeline, or the establishment of a temporary watering facility for the livestock and wildlife.

RANGE-6*: Prior to construction and placement of permanent facilities and access roads, TWE shall coordinate with the associated BLM FO and USFS forest to identify areas where the placement of tower structures, facilities, and access roads would prevent access to either a portion or all of a livestock grazing allotment resulting in the livestock grazing allotment becoming unusable or decreasing the AUMs available to a point that requires the grazing permit to be modified. In these areas, corrective actions would then be identified including rearranging of grazing allotment fences, additional access roads to the grazing allotment, re-arrangement of project facilities and access roads as feasible, etc.*

Effectiveness: These mitigation measures would further reduce potential impacts on grazing operations, range improvements, livestock, and livestock facilities.

In addition to project design features, post construction reclamation, and BMP's, mitigation measures would further reduce impacts to rangelands. Implementation of **RANGE-1** would provide livestock operators with the ability to plan their livestock activities around construction activities to minimize impacts. Mitigation measures **RANGE-2**, **RANGE-3**, **RANGE-4**, and **RANGE-5** would mitigate impacts to livestock facilities and range improvements associated with construction activities. **RANGE-5** would temporarily mitigate impacts to watering locations that could be disrupted by construction or operation activities. **RANGE-6** would mitigate impacts resulting from fragmentation of grazing allotments and the prevention of access due to the placement of project facilities.

The Northern Terminal contains a portion of WWEC segment 78-138 (see **Figure 2-4**). The WWEC corridors authorize the use of land for a variety of energy related purposes, including electricity transmission facilities. There would be no conflict with the purpose of designated WWEC corridors from proposed terminal facilities; the proposed terminal would be a compatible land use. No other land use authorizations would be affected by the construction, operation, and decommissioning of the Proposed Project in the Northern Terminal.

There would be no adverse impacts to existing and future land uses and management of land use authorizations in the Northern Terminal, because the proposed facilities in the Northern Terminal are compatible with the zoning designations applied to private lands.

Southern Terminal

The Southern Terminal facilities are proposed in the Eldorado Valley approximately 15 miles southwest of Boulder City, in Clark County, Nevada. The proposed Southern Terminal site would initially occupy 415 acres on private lands within the Southern Terminal, as shown in Chapter 2.0 on **Figure 2-17**. The Southern Terminal is located entirely within the Eldorado Valley on lands that have been annexed by Boulder City.

Land use in the Southern Terminal is guided by the goals, objectives, and strategies of the Boulder City Master Plan (Boulder City 2009), and controlled through zoning districts. Existing and future/planned uses within the Southern Terminal include: Open Lands, the majority of which are incorporated into the Boulder City Conservation Easement (BCCE), three existing substations (Eldorado Substation, McCullough Switching Station, and Marketplace Substation), an Energy Zone Solar Project (that includes the Copper Mountain Solar II project), an Energy Zone Expansion Area (that includes the Dry Lake Bed West and Copper Mountain North solar facilities), and existing utility corridors.

Details of the establishment of the BCCE and allowable uses are contained in the Management Action Plan for the BCCE (Clark County 2009). Per the 1995 Department of Interior Contract of Sale and Land Patent, the land within the BCCE is to be used for only three purposes: as a desert tortoise reserve; for public

recreation (including hiking, bird watching, bicycling, horseback riding, photography, sightseeing, picnicking and bird hunting); and as a possible site for a solar power peaking station.

Two alternative sites are being analyzed for the southern terminal in the Eldorado Valley; either would contain the same facilities. **Figures 3.14-5** and **3.14-6** show the Southern Terminal, the proposed terminal locations, existing and proposed energy production facilities, utility corridors, and Boulder City zoning districts in the Valley. The Southern Terminal would be located partially within the Energy Resources area, in an unmanaged area on which human activities predominate, but which may incidentally support populations of some covered species. The terminal facilities would be compatible with land uses within the designated Energy Resources area. The proposed terminal facilities would not be compatible with the conservation or recreation objectives for the rest of the BCCE. As shown in **Figures 3.14-5** and **3.14-6**, neither of the proposed terminal locations are located fully within the Energy Resources Area. The potential impacts to recreation uses and sensitive species in the BCCE are described in Section 3.13, Recreation Resources, and Section 3.7, Wildlife. The impacts to the values for which the BCCE was designated could be reduced through mitigation, limiting the proposed facilities to land within the designated Energy Resources area. The following mitigation measure is recommended to mitigate impacts to adjacent land uses:

LU-1: *The proponent will develop an approved POD and shall coordinate with land managers on final structure placement, including all aboveground components, access roads, and permanent disturbance areas, to ensure optimal compatible land use.*

Successful implementation of this mitigation measure to site the terminal facilities within the designated Energy Zone Expansion Area would reduce impacts on adjacent land uses as the location of the Southern Terminal would be compatible with existing energy uses and with the Boulder City Master Plan policies. The July 20, 2011, Boulder City Overview Map identifies that Sections 19 and 30 in T24 R63 are available for lease.

There are no producing croplands within the Southern Terminal. Grazing is prohibited on the BCCE and the adjacent Sloan Canyon National Conservation Area. Given the proposed expansion of the BCCE and the existing and planned solar developments on the Energy Zone Expansion Area it is unlikely that any grazing occurs within the Southern Terminal. Therefore, no impacts to livestock grazing are anticipated for the Southern Terminal.

The multi-modal WWEC Corridor 39-231 is located immediately adjacent to the proposed Southern Terminal (see **Figure 2-7**). In addition to this federally designated corridor, there are approximately 58 ROWs or easements on the BCCE, including two existing utility corridors that are partially within the Southern Terminal. Data describing the specific uses authorized by these ROW grants are not available; however many of these ROWs appear to be for electric transmission lines. The affected ROW grants would need to be analyzed individually once the specific location of the terminal is known to determine if there are any impacts to the intended use of the grant and what the level of those impacts would be. Impacts to non-utility/energy production ROWs would be reduced by locating proposed facilities on available land within the Energy Zone Expansion Area, because the proposed project is a compatible land use within that zone. No other known land use authorizations would be affected by the construction, operation, and decommissioning of the proposed project in the Southern Terminal.

Portions of the Southern Terminal are adjacent to the Nelson/Eldorado SRMA and the Sloan Canyon NCA. The Sloan Canyon NCA and most of the Nelson/Eldorado SRMA are on public lands, and would not be directly affected by the proposed terminal facilities; however, some recreational uses could be affected, primarily during construction (see Section 3.13, Recreation, and Section 3.15 Special Designations). Siting the proposed Southern Terminal facilities in the Energy Zone Expansion Area would avoid impacts to the BCCE and the Nelson/Eldorado SRMA SDAs. Following construction, disturbed areas would be reclaimed in accordance with the BMPs in **Appendix C**.

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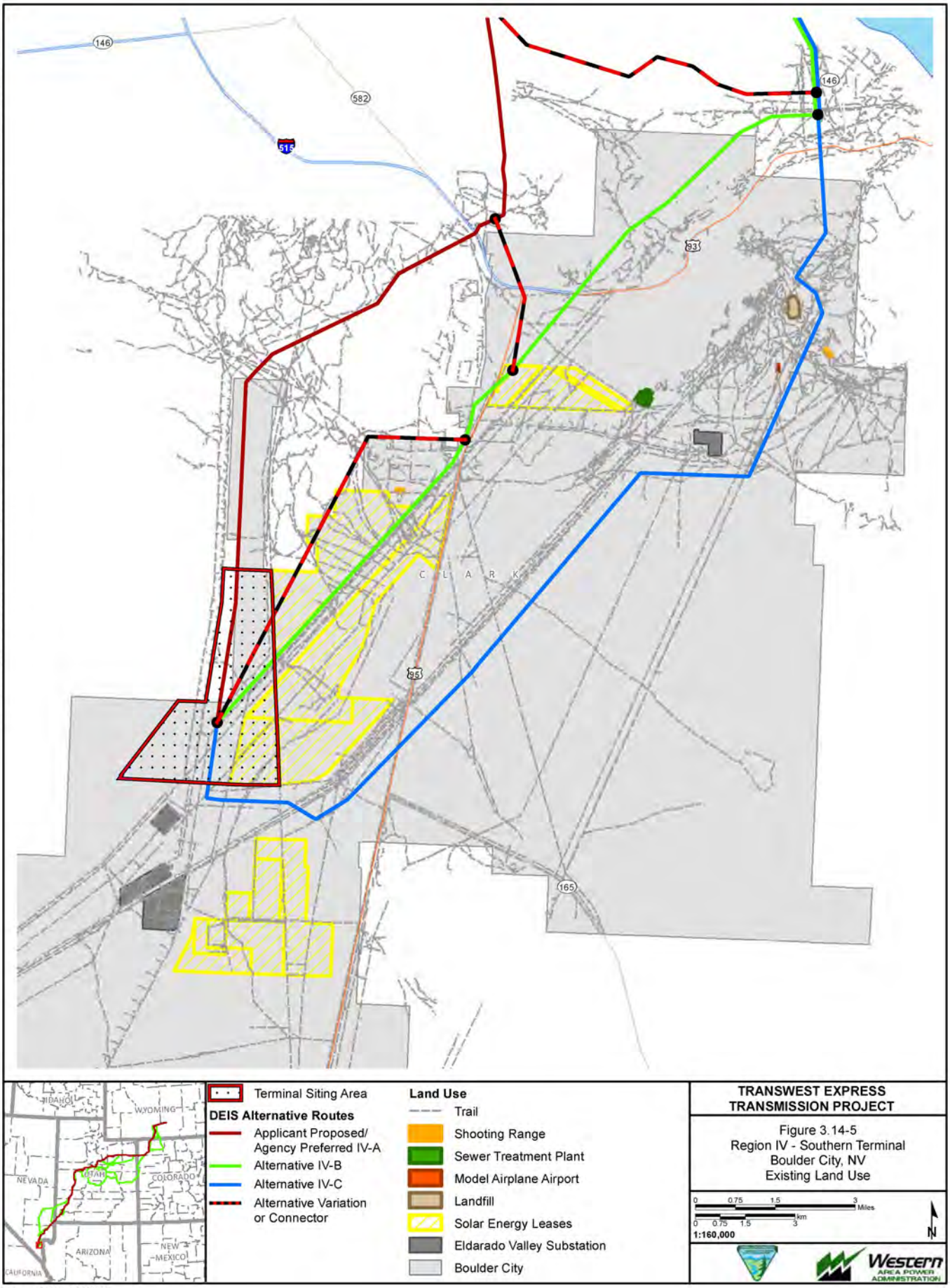

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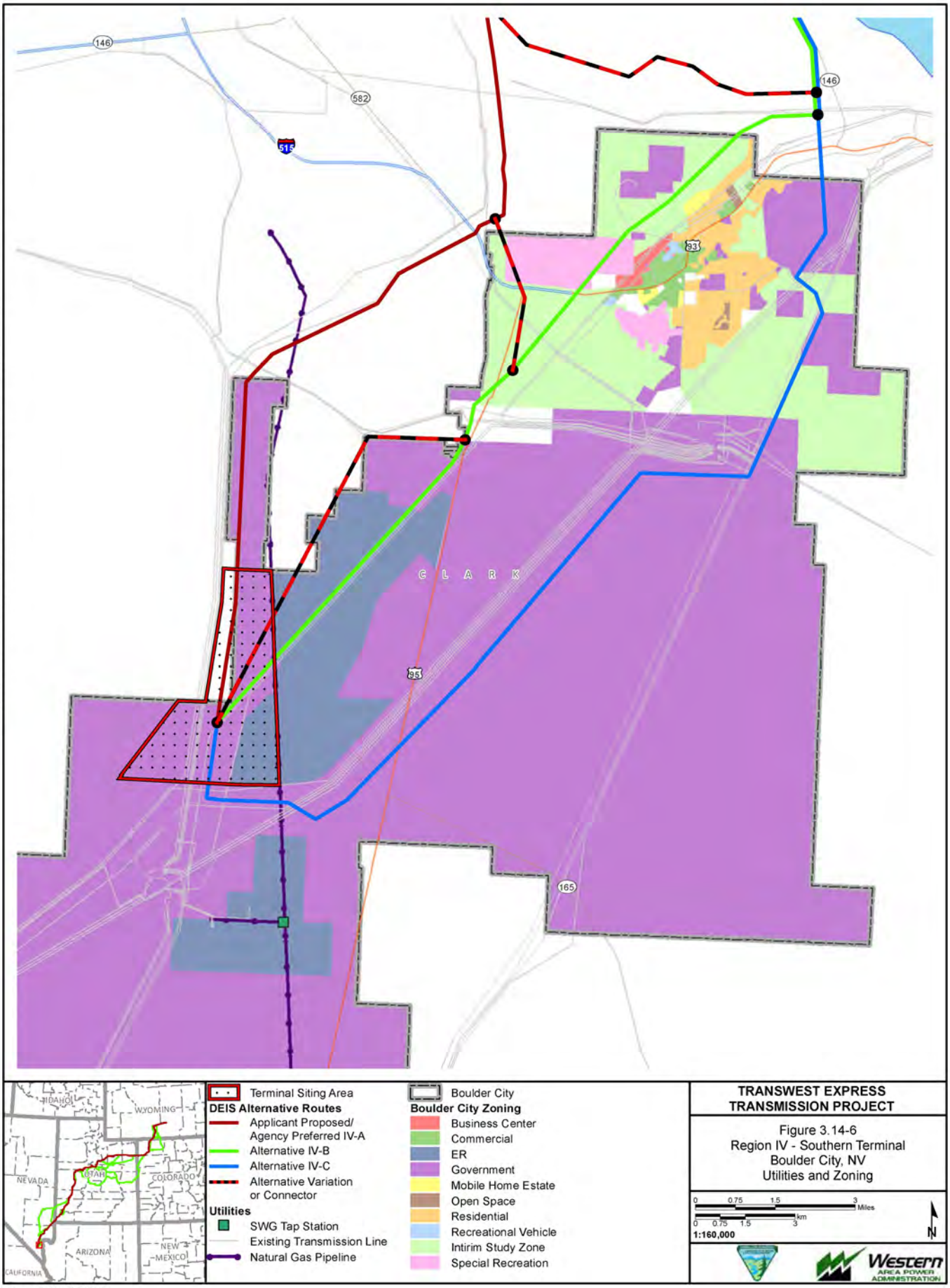

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Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

The design option involves modifications of proposed transmission facilities. Differences between this design option and the Proposed Project include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between the IPP and Marketplace. The southern converter station would be located near the IPP in Utah instead of at the Marketplace in Nevada and the ground electrode system would be within 50 miles of the IPP.

The relocated Southern Terminal would comprise 113 acres and would be located on BLM lands directly adjacent to the IPP in Millard County, Utah. Development of a ground electrode siting area would comprise 40 acres and would be located on BLM and state lands in Juab County. **Figure 3.14-7** depicts the location of the Southern Terminal and ground electrode areas. Construction and operation of these areas would not be expected to impact land use resources. There would be no communities or communication sites located within 1 mile of the proposed location. There are no structures within 500 feet of the reference line. There would be 1 recreation area (Little Sahara Recreation Area) and 1 wildlife study area (Fish Springs) within 1 mile of the proposed ground electrode bed siting area.

Design Option 2 would have no additional impacts to land resources than those previously described.

Design Option 3 – Phased Build Out

The design option involves modifications of proposed transmission facilities. Development of a substation would comprise 75 acres and would be located completely on BLM lands directly adjacent to the IPP within Millard County, Utah. The land that would be used for the substation is the same as that would be used for the Southern Terminal under Design Option 2 and is depicted on **Figure 3.14-7**.

3.14.6.2 Impacts Common to All Alternative Routes and Associated Facilities

Direct and indirect impacts to land resources in the four Project regions would occur from the construction, operation, maintenance, and decommissioning of the transmission line and associated temporary and permanent facilities associated with the alternative routes, alternative variations, and alternative connectors. At the end of the Project's 50-year ROW grant, or when it is determined that the project is no longer economical, the project would be decommissioned and the area reclaimed. Additional NEPA may be required for this action. Impacts from decommissioning of the proposed Project would be very similar to the effects from short-term construction activities as discussed in the following sections. Upon decommissioning, land use impacts from construction and operation of the project may be reversible with successful reclamation, and thus, no permanent land use impacts would be anticipated from the project under any alternative. Any changes in land use surrounding the developed transmission line as a result of the line's long-term operation may not be reversible upon decommissioning.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

This design option involves modifications of proposed transmission facilities that would apply to all alternatives. Under Design Option 2, the transmission line would be AC from Southern Terminal near the IPP to the Marketplace Hub in Nevada. Unlike DC power lines, AC transmission lines can cause induced current in nearby objects, such as buildings, fences, or other equipment in very close proximity to the transmission line. In order to minimize the potential for electric shock, buildings, fences, and other structures with metal surfaces located within 300 feet of the centerline would be grounded. All metal irrigation systems and fences that parallel the AC transmission line for distances of 500 feet or more, within 300 feet of the centerline would be grounded. Additionally, all fences that cross under the AC transmission line also would be grounded (**Appendix D**). Section 3.18, Public Health and Safety, provides more information regarding impacts from AC lines.

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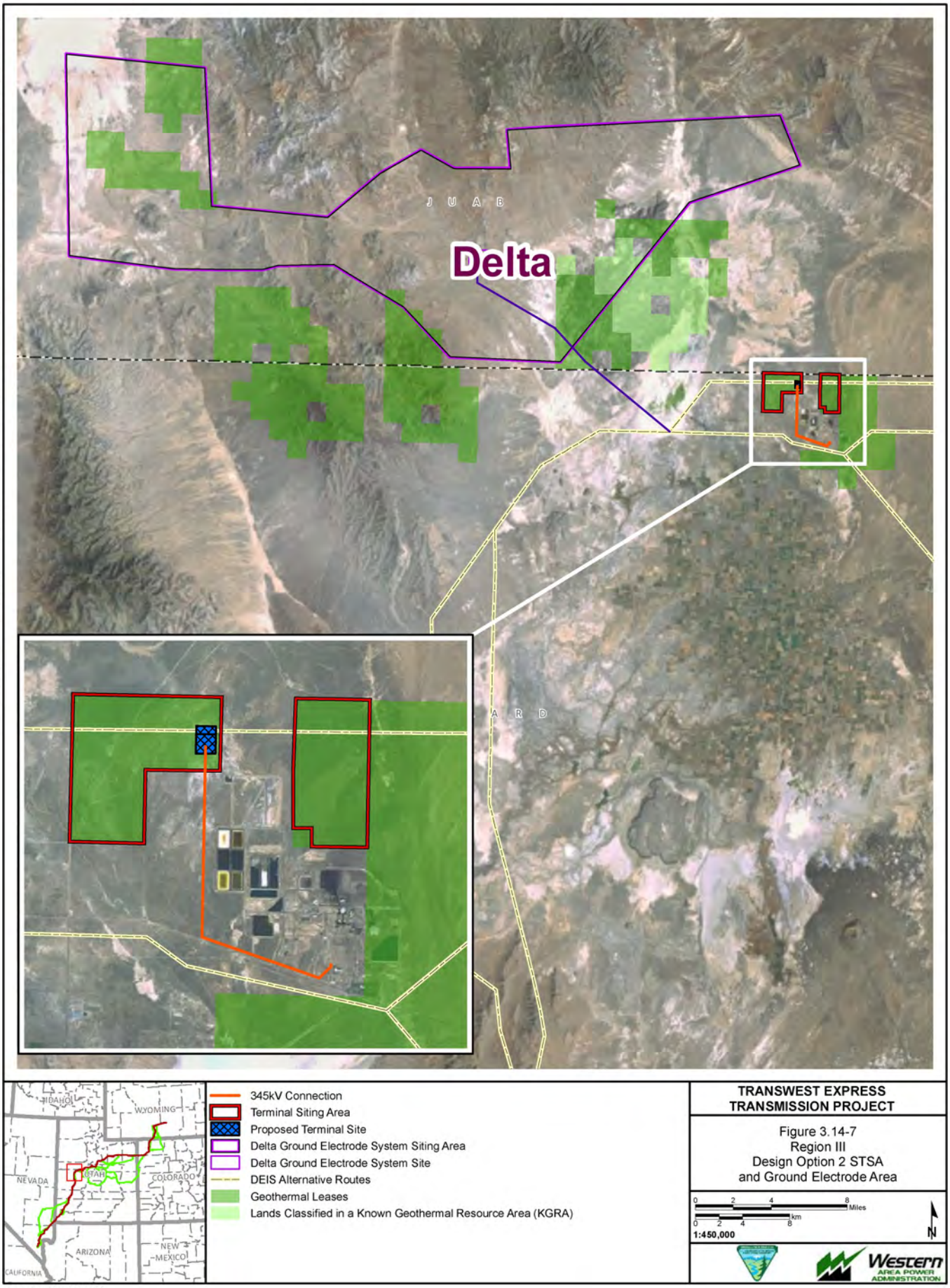

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-7
Region III
Design Option 2 STSA
and Ground Electrode Area

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Approximately 55 percent of this design option from IPP to Marketplace Hub would be constructed using AC power lines that are co-located with existing utility corridors that may contain pipelines, resulting in potential electrical interference from electric and magnetic induction. Additionally, high voltage AC transmission line located adjacent to a railroad may result in safety hazards, damage to signal and communication equipment, or false signaling of equipment. Design features identified in **Appendix D** and Section 3.18, Public Health and Safety, would minimize the potential for interference to pipelines, railway operating personnel, and the public.

Design Option 3 – Phased Build Out

This design option involves modifications of proposed transmission facilities that would apply to all alternatives. Design Option 3 would have no additional impacts to land resources than those previously described; however the timing would vary due to construction schedule differences from the Proposed Action and Alternatives. A two-phase approach would be initiated with the construction of a 442 mile AC transmission line between the proposed North Terminal in Sinclair, Wyoming and the IPP substation near Delta, Utah. The second phase would entail the construction of a DC transmission line from the IPP substation to the proposed Southern Terminal, south of Boulder City, Nevada. The timing of construction for the second phase would be determined by future market demands.

Land Ownership

No changes to current jurisdiction from the construction and operation of the Project alternative routes are anticipated. Minimal changes to private land ownership are anticipated, and would occur through the negotiation and acquisition of property in fee by TransWest for certain facilities that could include communication sites or ground electrode systems.

Existing and Planned Land Uses

Applicable BLM, USFS, and other federal agency management guidelines, objectives, and management plans were reviewed to identify potential management and land resource conflicts as a result of construction and operation of the Proposed Project. In general, operation of the Proposed Project will be in compliance with agency stipulations to meet agency resource objectives with the implementation of design feature TWE-1 (see **Appendix C**). Locations where the Project would not conform to existing federal agency management plans and the related impacts are discussed in Chapter 4.0, Plan Amendments.

County zoning and the county permitting processes for all affected counties are the primary tools for implementing county land use restrictions, including regulating development on private lands, and ensuring that proposed projects are developed in a manner that minimizes impacts to the county and county residents. The majority of the transmission line alternatives cross rural areas containing public and private lands. Zoning of private lands within the alternative corridors generally reflects the dominant agricultural (primarily grazing) land use. Most of the affected counties provide for the development of large transmission lines and associated facilities through zoning regulations; however, the development of transmission lines is not addressed in all zoning ordinances for every affected district. Many rural/agricultural zoning districts designate transmission lines and associated facilities as ‘allowed uses’ that are allowed by right within the respective zoning district. A ‘conditional use’ or ‘special use’ designation indicates that a specific use is allowed within the respective zoning district only after review and approval of a Conditional Use Permit or a Special Use Permit. Consultation with each county planning agency will ultimately be required to determine the procedure for permitting the Proposed Project within each county. The Proposed Project is anticipated to be generally consistent with applicable state or local land use plans, policies, goals, or regulations. All known instances of potential incompatibility are identified in the regional analyses contained in Section 3.14.6.3 through 3.14.6.6.

Land Use Authorizations

Land use authorizations on public lands include various types of leases, easements, and both linear and non-linear ROWs. Other land use authorizations and realty actions may include proposed land tenure adjustments of parcels that have been identified for either disposal or potential acquisition. Land tenure adjustments include land ownership transfers of parcels identified by the BLM through purchase, exchange, donation and sale, and are a component of the BLM's land management strategy to improve management of resources. There is currently no consistent dataset for the entire analysis area that provides the locations and types of land tenure adjustments, non-linear ROWs, or easements. However, these types of land use authorizations are common on public lands and are likely to occur throughout the analysis area.

Construction and operation of the transmission line could potentially result in an impact to various types of land use authorizations. Potential conflicts of the transmission line alternatives to other land use authorizations, easements, ROWs, and land tenure adjustment parcels would need to be addressed on a case-by-case basis with each federal land management agency. Land use authorizations may be temporarily impacted during construction and decommissioning. Operation of the proposed transmission line is anticipated to be generally compatible with most types of land use authorizations, since authorized activities could likely resume within the 250-foot-wide transmission line ROW once construction has been completed; however, land uses such as energy development would likely be permanently precluded from the 250-foot-wide transmission line ROW. In places where a conflict is unavoidable, minor shifts in the transmission line route or adjustments to the land use authorization may be required.

Agriculture

Direct and indirect temporary impacts to cropland within the 250-foot-wide transmission line ROW would occur from construction and decommissioning activities. The clearing and crossing with construction vehicles (drive and crush), and the surface disturbance from the construction phase would temporarily remove productive cropland within the ROW. Design feature TWE-40 (see **Appendix C**) provides for site-specific alignment of the 250-foot-wide transmission line ROW to reduce impacts to farm operations and agricultural production on producing croplands. Soils compacted by construction activities would be disked to reduce compaction and minimize impacts on agricultural operations (design feature TWE-41).

Producing croplands constitute a small proportion of all land cover types within the analysis area and it is anticipated there would be limited, if any, impacts to producing croplands from construction and decommissioning activities in the project corridors under any alternative. Because access roads and temporary work areas would easily be sited outside of producing croplands as provided for by design feature TWE-40, cropland removal was not quantified. Coordination with farm operators, avoidance of structure placement, and minimizing structure footprints in croplands would minimize the impacts to agricultural uses to small areas of long-term loss of agricultural lands.

All known instances of pivot irrigation systems within the 2-mile transmission line corridor are identified in the regional analyses contained in Section 3.14.6.3 through 3.14.6.6. Center pivot irrigation systems within the 2-mile transmission line corridor would be avoided by locating construction activities and access roads outside of pivot areas as provided for by design feature TWE-40; impacts to other types of conventional irrigation systems would be minimized though coordination with farm operators.

Access roads may be required through producing croplands in some locations. Access roads to proposed facilities would displace croplands. Construction vehicles on access roads would temporarily interfere with agricultural activities and would result in soil compaction and direct damage to crops if construction were to occur during the growing season. Coordination with farm operators, avoidance of access road placement in croplands, and restoration of croplands would minimize the impacts to agricultural uses to short-term loss of agricultural lands for temporary roads.

Land required for operation facilities within the 250-foot-wide transmission line ROW would be removed from production for the lifetime of the Project. The loss of productive cropland would be minor under any

alternative, because the land removed from crop production is very small relative to the cropland within ROWs that would continue to be available for crop production. The permanent removal of cropland from the operation of the action alternatives would be minor with the implementation of Design Feature TWE-40, which provides for the siting of facilities to avoid conflicts with agricultural activities. Additional mitigation (**AGRI-1**, **AGRI-2**, and **AGRI-3**) would eliminate conflicts by careful placement of structures and access roads, and through consideration of the use of self-supporting tower structures. Transmission structures that are not self-supporting and are located along roadways or property lines adjacent to croplands would require guy wires, which may intrude into croplands. Additional mitigation **AGRI-4** would reduce potential hazards to agriculture operations from the low visibility of guy wires.

AGRI-1*: Coordinate with farm and ranch operators to identify problems with structure placement and determine structure locations to ensure implementation of design feature TWE-40. Locate structures along fence lines, field lines, or adjacent to roads. Use longer spans between structures to clear fields. Consider use of non-guyed free-standing transmission structures in agricultural areas.*

AGRI-2*: Schedule construction activities to avoid planting and harvesting activities*

AGRI-3*: Minimize locating access roads within the 2-mile transmission line corridor in areas with croplands. For croplands that cannot be avoided by access roads, establish procedures for determining temporary and permanent access road locations with landowners and operators, and establish protection methods for roads over croplands that cannot be avoided by construction activities. Restore locations of temporary access roads to pre-construction conditions and leave permanent access roads intact through mutual agreement with the landowner and operator.*

AGRI-4*: Minimize the use of guy wires in crops and hay lands to the extent possible. If guy wires have to be used in crop and hay lands, highly visible shield guards will cover the wires.*

Prime farmland soil units in the 250-foot-wide transmission line ROW and 2-mile transmission line corridor generally occur in the same areas currently used for crop production; however, not all prime farmland soils are used for crop production. Section 3.3, Soils, provides an analysis of prime farmland soil units, including impacts from the long-term removal of potential crop production on prime soils.

Livestock Grazing

Direct impacts to grazing allotments from construction, operation, and decommissioning activities would include the loss of forage, fragmentation of grazing allotments, potential impacts to lambing areas and disruption of lambing periods, and increased mortality and injuries to livestock resulting from increased vehicle traffic. In addition, livestock could be temporarily displaced from preferred grazing areas, range improvements (including water sources), and range study plots by construction activities. Loss of forage would result from surface disturbance related to construction of the transmission line, access roads, and ancillary facilities, and the placement of permanent structures, access roads, and facilities. In addition, loss of forage would result from the potential conversion of native vegetation communities due to indirect effects such as erosion and the invasion and spread of noxious and invasive weed species. In areas where successful reclamation is difficult, or lengthy, the loss of forage would be considered a long-term impact. Fragmentation of grazing allotments would result from the placement of roads, facilities, and fences that prevent access to all or portions of individual grazing allotments.

Active lambing areas could be reduced or lost due to construction activities that take place in or near them. In addition, noise and human presence from construction activities near lambing areas could result in the disturbance of lamb and ewe pairs. Ewes disturbed by construction activities could abandon their lambs, resulting in increased lamb mortality. Construction activities that separated cattle from water or food sources requiring them to move during calving potentially could result in the separation of calves from their mothers. This could lead to an increase in calf mortality.

Construction activities would result in increased vehicle traffic and potentially increased vehicular speed on roads that are improved. Increased vehicle traffic and speeds would increase the potential for livestock/vehicle collisions. The control and management of livestock could be affected as physical barriers to livestock movement (fences) are removed. The construction of access roads in grazing areas could cause livestock to use roads as travel routes but could also provide alternate access to grazing allotments, water resources, grazing facilities, and livestock if retained for public use.

Indirect impacts would include the spread of noxious and invasive species and fragmentation of allotments. See Section 3.5, Vegetation, for further discussion of noxious and invasive species impacts on vegetation resources. Impacts to vegetation could lead to the loss of available native forage and increased livestock mortality. The construction of the transmission line, access roads, and temporary and permanent facilities associated with the project could lead to increased fragmentation of individual grazing allotments. Fragmentation of the allotments could result in additional loss of native shrubland communities and decrease available forage. Fragmentation would also result in the loss of access to all or various parts of the grazing allotment either through placement of new fences or facilities.

Range improvements on BLM and USFS grazing allotments, which include fences, gates, cattle guards, and stock tanks, could be directly removed or disturbed as a result of surface disturbance activities associated with construction activities. Additional impacts could occur through potential damage to fences, gates, and cattle guards, resulting in the accidental release of livestock. Impacts to water sources in livestock grazing allotments could reduce the areas available for grazing due to the semi-arid climate and lack of reliable water sources in much of the areas crossed by the project. Without a reliable water source, many areas currently available for grazing would not be able to support livestock. Long-term range monitoring sites could be directly removed or disturbed as a result of surface disturbance activities associated with construction activities.

Implementation of mitigation measures **RANGE-1** through **RANGE-5** would avoid or minimize impacts to range improvements.

Impacts to rangelands would be minimized by adherence to the BLM Rangeland Health Standards (H-4180-1). The BLM has developed the BLM Rangeland Health Standards for each state (43 CFR 4180.1). The Fundamentals of Rangeland Health outline the key fundamentals for rangeland health. These include:

1. Properly functioning watersheds;
2. Water, nutrients, and energy are cycling properly;
3. Water quality complies with State water quality standards; and
4. Threatened and endangered species habitat is being protected.

The standards address the minimum acceptable conditions for public rangelands based on the health, productivity, and sustainability of the rangelands.

In addition to the design features, BMPs, and proposed mitigation measures described above (Section 3.14.6.1, Impacts from Terminal Construction, Operation, and Decommissioning), the following mitigation measures are recommended for range resources:

RANGE-8*: Speed limits would be followed and signs would be erected in lambing/calving areas, shipping pastures, or adjacent to working corrals to warn vehicle operators of the agricultural operations.*

Effectiveness: The implementation of **RANGE-1** to **RANGE-6** is described above. Mitigation measure **RANGE-7** would promote awareness of areas of concern for livestock. By avoiding lambing areas and informing vehicle operators of operations, impacts to livestock would be minimized.

Operation impacts include the permanent loss of grazing allotments, forage capacity, AUMs, and livestock management due to facility, tower, access road footprints, and maintenance activities in the ROW.

The loss of grazing allotments for the tower footprints, ancillary footprints, and permanent access roads would be permanent for the life of the project, but the remaining areas would be reclaimed immediately following completion of construction as described in Section 3.5, Vegetation. The implementation of the proposed mitigation measures would minimize impacts to range improvements. Permanent fragmentation of allotments resulting in the loss of access to all or portions of the allotments would result in changes to the grazing permit, and potentially make the allotment unusable. Based on the implementation of the proposed mitigation measures, an irreversible loss of available rangeland that would make livestock production uneconomical would not be anticipated.

Residential and Other Built Environment

Impacts to residential uses, as well as to occupants of built environment areas, would include short-term, construction- and decommission-related disturbances. With the exception of oil and gas facilities, most residential, commercial, and industrial uses in the 250-foot-wide transmission line ROW and 2-mile transmission line corridor occur in close proximity to municipalities or on private lands generally zoned for agricultural or low-density residential uses. It is not anticipated that occupied residences would be removed within the 250-foot-wide transmission line ROW under any alternative. Existing structures would be avoided.

Occupants of structures within 500 feet of transmission reference lines would experience sights and sounds of construction activity, including the presence of materials, construction workers, and equipment during transmission line construction. These disturbances would decrease with increasing distance from the transmission reference line (see Section 3.18, Public Health and Safety, for additional information regarding noise attenuation). In addition, access to residential, commercial, and industrial use areas may be temporarily disrupted at some locations. It is assumed that the residences are occupied; however, at this time no field verification has been conducted. TransWest design features addressing dust control and public health and safety (see **Appendix C**) would reduce the disturbances and hazards associated with construction activities. Additional discussion of these impacts, and the design features and agency BMPs that reduce these impacts, are addressed in Section 3.18, Public Health and Safety. Operations-related maintenance traffic and activities would not have access to existing structures.

3.14.6.3 Region I

The dominant land ownership crossed by each alternative in Region I are federal lands managed by the BLM and private lands. The ROWs and corridors also include state-owned lands in Wyoming and Colorado (see **Figure 2-12**). Agriculture and grazing are the major land use in Region I. Impact parameters for land use in Region I are tabulated in **Table 3.14-8** by alternative route.

Table 3.14-8 Region I Alternative Route Land Use Impact Parameters

Impact Parameters		Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Jurisdiction	BLM (miles/percent of alternative within region)	115/74%	113/71%	82/44%	128/74%
	Rawlins	58	61	45	76
	Little Snake	44	40	25	40
	White River	12	12	12	12
	Private (miles/percent of alternative within region)	38/25%	41/26%	86/47%	39/23%
	State (miles/percent of alternative within region)	2/1%	5/3%	17/9%	4/3%
	Total (miles)	**155**	**159**	**186**	**171**
Wyoming	Carbon	58	32	72	81
	Sweetwater	32	62	10	26

Table 3.14-8 Region I Alternative Route Land Use Impact Parameters

Impact Parameters		Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Colorado	Moffat	65	65	102	64
	Routt	0	0	3	0
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative within region)[2]	4/3%	5/3%	17/9%	4/2%
	Length within WWEC designated corridors (miles/percent of alternative)[3]	4/3%	27/17%	38/20%	5/3%
	Total (miles/percent of alternative)	**6/4%**	**31/20%**	**39/21%**	**7/4%**
Co-location	Greenfield/co-located (miles)	93/62	91/68	88/98	109/63
Agricultural Lands	Additional ROW clearing and vegetation disturbance (acres)	19	27	357	27
	Construction disturbance (acres)	14	18	255	18
	Operation disturbance (acres)	4	5	68	5
	Number of center pivots crossed by reference line (count)	0	0	1	0
	Number of center pivots within Project corridor (count)	2	2	2	2
Livestock Grazing	Construction disturbance (acres)	2,003	2,031	1,955	2,253
	Estimated decreased AUMs (AUMs/percent of total AUMs)[4]	100/<1%	102/<1%	98/<1%	113/<1%
	Operation disturbance (acres)	509	481	471	516
	Long-term decreased AUMs[4]	25/<1%	24/<1%	24/<1%	26/<1%
Communities	Count of communities within 2-mile transmission line corridor	0	0	1	0
Structures within 500 feet of reference line	Residential (count)	0	0	9	0
	Commercial/Industrial/Oil and Gas facilities (count)	45	47	24	39
	Agricultural (count)	0	0	0	0
	Outbuilding (count)	3	7	11	3
	Total (count)	**48**	**54**	**44**	**42**
Structures within 200 feet of reference line	Residential (count)	0	0	0	0
	Commercial/Industrial (count)	11	9	4	9
	Agricultural (count)	0	0	0	0
	Outbuilding (count)	3	3	4	3
	Total (count)	**14**	**12**	**8**	**12**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

[4] The AUM decrease was calculated based on an average number of AUMs per acre for the grazing allotment acreage lost.

Note: Discrepancies in totals due to rounding error.

As shown on **Figure 2-4**, there are a number of WWEC designated utility corridors within Region I that could be used by the project alternatives. **Table 3.14-9** provides details of these WWEC designated utility corridors. With the exception of Corridor 73-133 which is designated “underground-only”, all of the WWEC corridors that would be used by project alternatives are either multi-modal or electric only. The use of an underground-only corridor for an overhead electric transmission line would be a conflict with the designated use of the corridor.

Table 3.14-9 WWEC Designated Utility Corridors Potentially Used by the Project Alternatives and Variations in Region I

State	WWEC Corridor Number	Designation[1]	Used by Project Alternatives and Variations	Notes
Wyoming	78-138	Multi-modal	All Alternatives	Reference line is located immediately south of designated corridor.
Wyoming	138-143	Multi-modal	Alternative I-C	No conflict expected.
Wyoming and Colorado	73-133	Underground-Only	Alternative I-B	Conflict with corridor designation as underground-only.
Colorado	138-143	Electric-Only	Alternative I-C	No conflict expected.
Colorado	133-142	Multi-modal	Alternative I-C	No conflict expected.
Colorado	126-133	Multi-modal	All Alternatives	No conflict expected.

Alternatives I-A, I-B, I-C, and I-D cross through the counties listed in **Table 3.14-10**. Existing and future land use spatial data, in a digital or paper map format, were not available for all counties in the region. This is because the majority of lands in unincorporated areas outside of municipalities are comprised of federal or state lands; or because the zoning designations describe the planned/future land use and separate planning maps were not available.

Table 3.14-10 Consistency with Applicable County Land Use Plans and Policies in Region I

Regulating Agency	Plan, Policy, or Regulation	Allowed Uses in Agency Designated Land Management Districts Crossed by Proposed Project
Carbon County, Wyoming	Carbon County Comprehensive Land Use Plan, April 2012. Carbon County Zoning Resolution of 2003; Amended April 5, 2011	Land Use- Agriculture Future Land Use – Rural Agriculture, Agricultural Rural Living Zoning - Ranching, Agriculture, Mining District; electric transmission lines over 69 kV are a Conditionally Permitted Use.
Sweetwater County, Wyoming	Sweetwater County Comprehensive Plan, 2002. Sweetwater County Zoning Resolution, 2011 Sweetwater County Conservation District Land and Resource Use Plan and Policy Sweetwater County Growth Management Plan	Land Use- Agriculture Future Land Use – no available spatial data Zoning – Agriculture; Transmission Lines, Stations, and Towers are a Permitted Use by right. Rural Residential district – not specified Encourages identification and application of ROWs in order to support multiple uses on public lands, so long as there is adequate and just compensation of private property when the right-of-way crosses private land. Comprehensive Plan goals are to: "Recognize and protect the County's unique cultural, recreational, environmental and historic resources." To meet the intent of this goal, Sweetwater County encourages actions that avoid or minimize impacts to: Adobe Town, Haystacks, Willow Creek Rim, Powder Mountain and the Overland and Cherokee Trails (Sweetwater County 2013).
Moffat County, Colorado	Moffat County Master Plan	Land Use- Agriculture Future Land Use – Rural Character Area Zoning - Agriculture district: Public utilities, including transmission lines, subject to a Conditional Use Permit.

Table 3.14-10 Consistency with Applicable County Land Use Plans and Policies in Region I

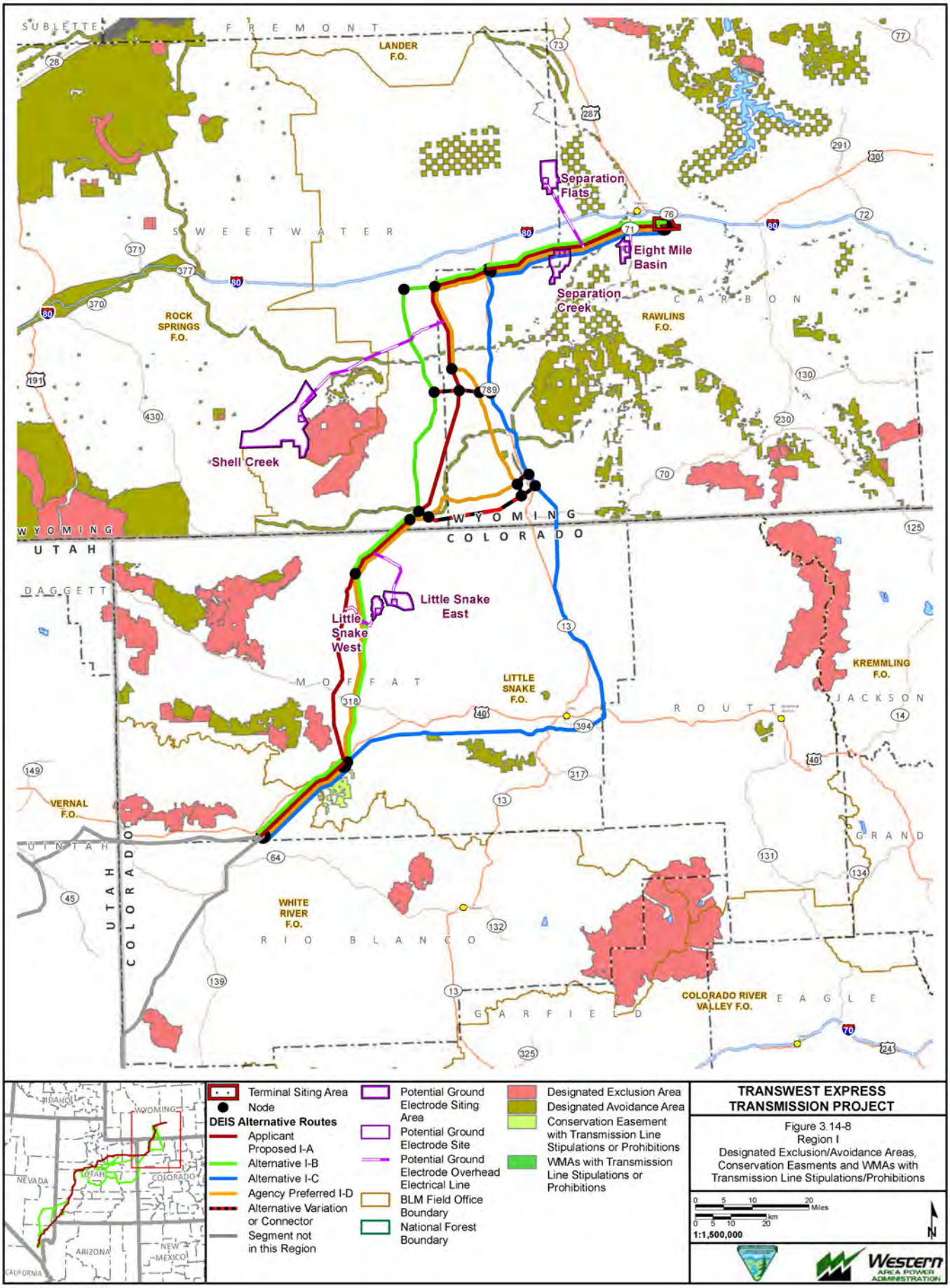
Regulating Agency	Plan, Policy, or Regulation	Allowed Uses in Agency Designated Land Management Districts Crossed by Proposed Project
Routt County, Colorado	Routt County Master Plan	Land Use- Agriculture Future Land Use – not within designated Growth Centers Zoning - the County will not approve development applications or special use permits that would lead to the degradation of the environment without mitigation and will discourage development on ridges that results in skylining.
Daggett County, Utah	Daggett County General Plan Daggett County Zoning Ordinance	Land Use- Clay Basin region: grazing and energy. Browns Park region: public land amenities, agriculture, grazing. Open lands outside of master planning regions. Future Land Use – no available spatial data Zoning - Multiple Use M-U-40: not specified
Uintah County, Utah	Uintah County Zoning Ordinance (2005) Uintah County Land Use Plan (2010)	Land Use- Recreation, Forestry, and Mining; Mining and Grazing; Agricultural; Low Density Agricultural; Industrial; Industrial-Commercial Future Land Use – Recreation, Forestry, and Mining; Mining and Grazing; Agricultural; Low Density Agricultural; Industrial; Industrial-Commercial Zoning - Recreation, Forestry, and Mining district, Agriculture district, Light Industrial district. Transmission line or public utilities, with exception of substations, not specified as an allowable, special, or conditional use under any zoning district.

According to the RMPs, some areas are designated as avoidance areas to protect sensitive resource values. The designated avoidance areas within Region I are outlined in **Table 3.14-11**. The Cherokee Trail and the Overland Trail, which are both crossed by each alternative route, are designated as avoidance areas for new linear crossings. The Rawlins RMP requires that linear crossings of these historic trails occur in previously disturbed areas. Impacts to Historic Trails are discussed in Section 3.11, Cultural Resources, and Section 3.15, Special Designation Areas. **Figure 3.14-8** identifies designated avoidance areas as well as conservation easement areas with overhead line prohibitions.

Table 3.14-11 Designated Avoidance Areas Within Region I

Avoidance/Exclusion	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Avoidance Areas	Overland Trail Rawlins FO Avoidance Area (not described in available data)	Overland Trail Rawlins FO Avoidance Area (not described in available data)	Overland Trail Rawlins FO Avoidance Area (not described in available data) Juniper Mountain	Overland Trail Rawlins FO Avoidance Area (not described in available data)
Reference Line Crossing Avoidance (miles)	1	<1	2	3
Exclusion Areas	none	none	none	none
Reference Line Crossing Exclusion (miles)	0	0	0	0
Conservation easement or WMA transmission line restrictions	Overlaps with the Tuttle Ranch conservation easement[1]	Overlaps with the Tuttle Ranch conservation easement[1]	Overlaps with the Tuttle Ranch conservation easement[1]	Overlaps with the Tuttle Ranch conservation easement[1]

[1] Overhead transmission lines prohibited.



TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-8
Region I
Designated Exclusion/Avoidance Areas, Conservation Easments and WMAs with Transmission Line Stipulations/Prohibitions

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Alternative I-A (Applicant Proposed)

Approximately 74 percent of the 155-mile Alternative I-A route would be located on BLM-managed lands; an additional 1 percent would be located on state lands. Four miles of Alternative I-A would be in BLM-designated utility corridors and 4 miles would be in WWEC utility corridors. A total of 62 miles would be co-located with other ROWs. Designated avoidance areas are crossed by the reference line for 1 mile near the Overland Trail and Cherokee Trail areas. This equates to approximately 22 acres out of a total of 596,855 in the entire FO. Construction in these areas would require adherence to controlled surface use stipulation and agency BMPs.

An estimated 2,003 acres (100 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 509 acres (25 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

Under Alternative I-A, approximately 38 miles (25 percent) would cross private land. Alternative I-A would also result in 19 acres of additional ROW clearing, 14 acres of construction disturbance, and 4 acres of permanent removal of croplands. No center pivots are within the 250-foot-wide transmission line ROW; two center pivots are located within the 2-mile transmission line corridor.

There would be 45 commercial/industrial structures within 500 feet of the proposed reference line; the majority of the commercial/industrial structures are oil and gas pads. Land use conflicts would be eliminated by use of requisite buffers between well pads and transmission lines. Gathering systems or pad access roads within the area are not included in the above “structure” count. Application of **LU-1** would reduce impacts by working with land managers to avoid road construction or other incompatible uses within the area used for oil and gas development.

There would be no communities within the 2-mile transmission line corridor.

Under Alternative I-A, approximately 3 miles of the 250-foot-wide transmission line ROW would be located within the Tuttle Ranch conservation easement, which prohibits overhead transmission lines; however, the 250-foot-wide transmission line ROW could be relocated onto the portion of the 2-mile transmission line corridor located outside of the conservation easement area. Alternative I-D contains an analysis of micro-siting options to place the 250-foot-wide ROW outside of the conservation easement.

Alternative I-B

Approximately 71 percent of the 159-mile Alternative I-B route would be located on BLM-managed lands; an additional 3 percent would be located on state lands. Five miles of Alternative I-B would be in BLM-designated utility corridors and 27 miles would be in WWEC utility corridors. A total of 68 miles would be co-located with other ROWs. Designated avoidance areas are crossed by the reference line for less than 1 mile around the Overland Trail and Cherokee Trail areas. This equates to approximately 8 acres out of a total of 596,855 in the entire FO.

An estimated 2,031 acres (102 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species,

community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 481 acres (24 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

Under Alternative I-B, approximately 41 miles (26 percent) would be located on private land. Alternative I-B would result in 27 acres of additional ROW clearing, 18 acres of construction disturbance, and 5 acres of permanent removal of croplands. No center pivots are within the 250-foot-wide transmission line ROW; two center pivots are located within the 2-mile transmission line corridor.

There would be 47 commercial/industrial structures and 7 outbuildings within 500 feet of the proposed reference line; the majority of the commercial/industrial structures are oil and gas pads. Land use conflicts would be eliminated by use of requisite buffers between well pads and transmission line. Gathering systems or pad access roads within the area are not included in the above “structure” count. Application of **LU-1** would reduce impacts by working with land managers to avoid road construction or other incompatible uses within areas used for oil and gas development.

There would be no communities within the 2-mile transmission line corridor.

Under Alternative I-B, approximately 3 miles of the 250-foot-wide transmission line ROW would be located within the Tuttle Ranch conservation easement, which prohibits overhead transmission lines; however, the 250-foot-wide transmission line ROW could be relocated onto the portion of the 2-mile transmission line corridor located outside of the conservation easement area. Alternative I-D contains an analysis of micro-siting options to place the 250-foot-wide ROW outside of the conservation easement.

Alternative I-C

Approximately 44 percent of the 186-mile Alternative I-C route would be located on BLM-managed lands; an additional 9 percent would be located on state lands. Seventeen miles of Alternative I-C would be in BLM-designated utility corridors and 38 miles would be in WWEC utility corridors. A total of 98 miles would be co-located with other ROWs. Designated avoidance areas are crossed by the reference line for 1 mile around the Overland Trail and Cherokee Trail areas and 1 mile of Juniper Mountain.

An estimated 1,955 acres (98 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 471 acres (24 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

Under Alternative I-C, approximately 86 miles (47 percent) would be located on private land. Alternative I-C would result in 357 acres of additional ROW clearing, 255 acres of construction disturbance, and 68 acres of permanent removal of croplands. One of the two center pivots located within the 2-mile transmission line corridor would be within the 250-foot-wide transmission line ROW.

There would be 9 residences and 24 commercial structures within 500 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. Land use conflicts would be eliminated by use of requisite buffers between well pads and transmission line. Gathering systems or pad access roads within the area are not included in the above “structure” count. Application of **LU-1** would reduce impacts by working with land managers to avoid road construction or other incompatible uses within areas used for oil and gas development.

Portions of the City of Craig, Colorado would be within the in the vicinity of 2-mile transmission line corridor. **Figure 3.14-9** provides a close-in view of residential uses and other land uses the Craig. There are no identified incompatible land uses within this community. The 2-mile transmission line corridor, would also encompass Juniper Hot Springs, a privately owned mineral springs located south of Maybell, Colorado. However, the resort would be located at the far edge of the 2-mile transmission line corridor and on the side of the Yampa River opposite of the transmission line and is therefore unlikely to be affected by construction or operation of the line.

Under Alternative I-C, approximately 3 miles of the 250-foot-wide transmission line ROW would be located within the Tuttle Ranch conservation easement, which prohibits overhead transmission lines; however, the 250-foot-wide transmission line ROW could be relocated onto the portion of the 2-mile transmission line corridor located outside of the conservation easement area. Alternative I-D contains an analysis of micro-siting options to place the 250-foot-wide ROW outside of the conservation easement.

Alternative I-D (Agency Preferred)

Approximately 74 percent of the 171-mile Alternative I-D route would be located on BLM-managed lands; an additional 3 percent would be located on state lands. Four miles of Alternative I-D would be in BLM-designated utility corridors and 5 miles would be in WWEC utility corridors. A total of 63 miles would be co-located with other ROWs. Designated avoidance areas are crossed by the reference line for 3 miles around the Overland Trail and Cherokee Trail areas. This equates to approximately 79 acres out of a total of 596,855 in the entire FO.

An estimated 2,253 acres (113 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 516 acres (26 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

Under Alternative I-D, approximately 39 miles (23 percent) would be located on private land. Alternative I-D would also result in 27 acres of additional ROW clearing, 18 acres of construction disturbance, and 5 acres of permanent removal of croplands. No center pivots would be affected by the project reference line; there would be two center pivots within the 2-mile transmission line corridor.

There would be 39 commercial/industrial structures within 500 feet of the proposed reference line; the majority of which are oil and gas pads. Land use conflicts would be eliminated by use of requisite buffers between well pads and transmission line. Gathering systems or pad access roads within the area are not included in the above “structure” count. Application of **LU-1** would reduce impacts by working with land managers to avoid road construction or other incompatible uses within the area used for oil and gas development.

There would be no communities within the 2-mile transmission line corridor.

Tuttle Easement Micro-siting Options

The Tuttle Easement Micro-siting Option 1 would decrease the mileage crossing private lands by 0.4 miles and increase the mileage crossing BLM lands by 0.3 miles resulting in an overall decrease of 0.1 miles. Of the three micro-siting options, Option 1 disturbs less greenfield and takes advantage of co-location and dedicated utility corridors more than options 2 or 3. Disturbance to agricultural lands would be reduced by 4.3 miles. This option would cross the Tuttle Conservation Easement for a total of 3 miles.

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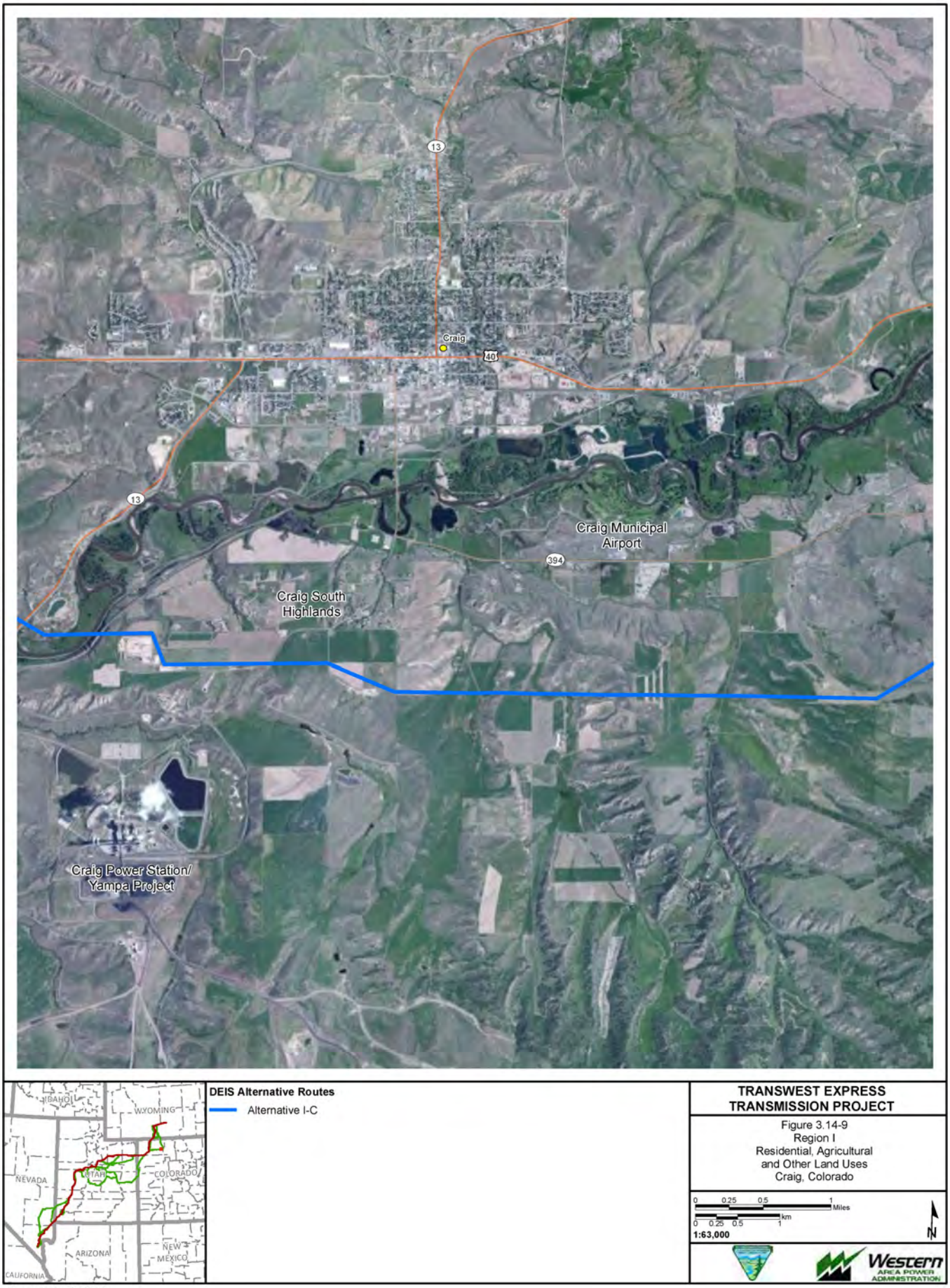

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The Tuttle Easement Micro-siting Option 2 would decrease the mileage crossing BLM lands by 2.3 miles and increase the mileage crossing private lands by 1.6 miles. Disturbance to agricultural lands would be reduced by 2.4 miles. Additionally, there would be 0.1 miles of NPS lands that would be crossed. No portion of this option would cross the Tuttle Conservation easement.

The Tuttle Easement Micro-siting Option 3 would decrease the mileage crossing BLM lands by 2.3 miles and increase the mileage crossing private lands by 1.6 miles. Disturbance to agricultural lands would be reduced by 2.7 miles. Additionally, there would be 0.1 miles of NPS lands that would be crossed. No portion of this option would cross the Tuttle Conservation easement.

Impacts to livestock grazing are similar between the three Tuttle Easement micro-siting options and the comparable portion of Alternative I-D.

Alternative Variation in Region I

There are no alternative variations within Region I.

Alternative Connectors in Region I

Table 3.14-12 summarizes the key aspects and impacts of the alternative connectors. In general, the selection of connectors may reduce or eliminate impacts to land resources compared to the action alternatives.

Table 3.14-12 Impact Parameters of Lands Crossed by Alternative Connector Reference Lines in Region I (miles)

Impact Parameter		Mexican Flats Alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Jurisdiction	BLM (miles)	9	18	3	2
	Rawlins	9	18	3	2
	Private (miles)	0	4	0	0
	State (miles)	1	1	1	<1
	Total (miles)	**10**	**22**	**3**	**2**
Designated Utility Corridors		<1 mile in BLM RMP corridors; 1 mile in WWEC corridor.	<1 mile in BLM RMP corridors; 1 mile in WWEC corridor.	<1 mile in BLM RMP corridors; <1 mile in WWEC corridor.	0 miles in BLM RMP or WWEC corridors.
Co-location					
Greenfield/Co-located mileage		10/0	22/0	3/0	2/0
Agriculture		No disturbance to agriculture lands due to clearing, construction, or permanent removal of croplands.	No disturbance to agriculture lands due to clearing, construction, or permanent removal of croplands.	No disturbance to agriculture lands due to clearing, construction, or permanent removal of croplands.	No disturbance to agriculture lands due to clearing, construction, or permanent removal of croplands.

Table 3.14-12 Impact Parameters of Lands Crossed by Alternative Connector Reference Lines in Region I (miles)

Impact Parameter	Mexican Flats Alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Livestock Grazing	Construction impacts 129 acres (6 AUMs); Operation impacts 26 acres (1 AUM).	Construction impacts 277 acres (14 AUMs); Operation impacts 66 acres (3 AUMs).	Construction impacts 80 acres (4 AUMs); Operation impacts 8 acres (<1 AUM).	Construction impacts 25 acres (1 AUM); Operation impacts 5 acres (<1 AUM).
Structures	No structures within 500 feet of reference line.	No structures within 500 feet of reference line.	No structures within 500 feet of reference line.	No structures within 500 feet of reference line.
Avoidance/exclusion areas	The connector corridor does not overlap avoidance/ exclusion areas.	<1 mile of overlap with the Rawlins FO avoidance area.	The connector corridor does not overlap avoidance/ exclusion areas.	The connector corridor does not overlap avoidance/ exclusion areas.

Note: Discrepancies in totals due to rounding.

Alternative Ground Electrode Systems in Region I

A ground electrode system of approximately 600 acres in size would be necessary in Region I within 50 to 100 miles of the northern terminal, as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the project proponent. The ground electrode system alternative locations in Region I are depicted in Chapter 2.0 on **Figure 2-12**. The conceptual locations would be located on BLM lands that are not within croplands or on private lands without residences and other built-environment uses. Initial and permanent disturbances to grazing from the construction and operation of ground electrode systems in conceptual areas in Region I would be no greater than 600 acres and 20 AUMs (<1 percent).

Region I Conclusion

Alternatives I-A, I-B, I-C, and I-D have similar impacts to most of the parameters discussed. Alternatives I-B and I-C would utilize a greater amount of designated corridors (31 miles [20 percent] and 30 miles [21 percent] of the route, respectively) compared to Alternatives I-A and I-D (6 miles [4 percent] and 7 miles [4 percent], respectively). Alternative I-C would have the greatest impact to agricultural lands. Alternative I-D would cross more miles of avoidance areas than any other alternative, and Alternative I-B would cross the fewest. Livestock grazing impacts would be fairly similar for each alternative in Region I with the greatest impacts occurring on Alternative I-D, and the fewest on Alternative I-C. Less than 1 percent of grazing allotments would be impacted by each alternative in Region I.

There are no alternative variations in Region I.

The alternative connectors in Region I include the Mexican Flats, Baggs, Fivemile Point North, and Fivemile Point South connectors. In most respects, their impacts would be similar. The Fivemile Point South Connector would not utilize any designated corridors; however, it is only a 2-mile connector compared to the Baggs Connector, which utilizes 2 miles of a designated corridor but totals 22 miles (20 miles outside of designated corridors). The Fivemile Point South Connector would only impact 25 acres of grazable land whereas the Baggs Connector would impact 277 acres. Again, this is the difference between a 2-mile

connector versus a 22-mile connector. The Baggs Connector would cross less than 1 mile of the Rawlins FO avoidance area.

3.14.6.4 Region II

The majority of lands crossed by the alternatives in Region II are BLM-managed and privately owned. The reference lines under all action alternatives also cross USFS lands in Utah, and state-owned lands in Colorado and Utah (**Figure 2-13**). Within Utah, state lands acreage includes intermingled state lands and county lands. USFS lands include portions of the Uinta National Forest, the Ashley National Forest, the Manti-La Sal National Forest, and the Fishlake National Forest (**Table 3.14-13**). Croplands in Region II occur in Colorado along the Yampa River, and in central and eastern Utah. A portion of the Utah Launch Complex, a sub-installation of the White Sands Missile Range (Department of Defense land) is crossed south of Green River, Utah. The complex served as an off-range missile test facility for Air Force and Army missile programs and has been inactive since 1974 (BTI 1984). Impact parameters for land use in Region II are tabulated in **Table 3.14-14** by alternative route.

Alternatives II-A, II-B, II-C, II-D, II-E, and II-F cross through counties and municipalities listed in **Table 3.14-15** and would be subject to the zoning designations described.

Figure 3.14-10 shows croplands and other land uses in the Huntington – Lawrence – Castle Dale portion of Emery County that would be within the 2-mile transmission line corridor for Alternatives II-B and II-C, or the Castle Dale Alternative Connector. **Figure 3.14-11** shows land uses within the portion of the City of Nephi that would be within the 2-mile transmission line corridor for Alternatives II-A and Alternatives II-B, II-D and II-E (which have the same route through this area). **Figure 3.14-12** shows land uses within the portion of Helper City that would be within the 2-mile transmission line corridor for Alternative II-D. **Figure 3.14-13** shows land uses within the portion of Mt. Pleasant that would be within the 2-mile transmission line corridor for Alternatives II-B. **Figure 3.14-14** shows land uses within the portion of Roosevelt City that would be within the 2-mile transmission line corridor for Alternatives II-A and II-E.

Avoidance and exclusion areas occur within the ROWs and corridors under Alternatives II-B and II-C. Alternatives II-A, II-B, II-D, and II-E all cross some conservation easement areas or wildlife management areas (WMAs) with some stipulations regarding transmission lines. **Table 3.14-16** summarizes avoidance areas and exclusion areas within project corridors. The mileages crossed by each alternative in avoidance and exclusion areas also are presented. A land use plan amendment would be necessary for Alternatives II-B and II-C as they both pass through exclusion areas. **Figure 3.14-15** identifies Region II designated avoidance areas and conservation easement areas with overhead line prohibitions.

<u>Alternative II-A (Applicant Proposed)</u>

Approximately 47 percent of the 257-mile Alternative II-A route would be located on BLM or USFS-managed lands; an additional 11 percent would be located on state lands. Alternative II-A would have 26 miles in BLM-designated utility corridors, and 56 miles in WWEC corridor. A total of 225 miles would be co-located with other ROWs. Five miles of avoidance areas in state WMAs and 7 miles of exclusion area in a conservation easement would be crossed by this alternative. The 250-foot-wide transmission line ROW for Alternative II-A would cross the 22,857-acre Currant Creek/Wildcat WMA and the 3,070-acre Strawberry River WMA, both of which serve as mitigation for wildlife habitat during construction of the Central Utah Project. The 11,867-acre Sand Wash/Sink Draw conservation easement also would be crossed. It prohibits overhead transmission lines and development of a transmission line in this area would not be in conformance with area management. The 250-foot-wide transmission line ROW for Alternative II-A also would cross the North Nebo WMA – Spencer Fork Unit and South Nebo WMA – Triangle Ranch Unit WMAs. These WMAs also have land patent reversionary parcels or other stipulations prohibiting uses that are not consistent with area goals.

Table 3.14-13 Region II National Forest Management Area Impacts by Alternative

Jurisdiction	Description	**Alternative II-A** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-B** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-C** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-D** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-E** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-F** miles-acres 250-foot ROW/acres 2-mile corridor
Ashley National Forest	MA D: Livestock Grazing	--	--	--	0 – 9/2,737	0/1,563	4 – 18/3,212
	MA E: Wildlife Habitat Emphasis	--	--	--	0 – 2/160	0/3	0 – 2/160
	MA F: Dispersed Recreation Roaded	--	--	--	0	1 – 20/744	<1 – 8/246
	MA N: Existing Low Management Emphasis	--	--	--	0/1,243	9 – 276/13,133	<1 – 12/1,763
Uinta National Forest	#1.4 Wilderness (Nephi)	0/ <1	--	--	--	--	--
	#2.5 Scenic Byways (Nephi)	0 /31	--	--	0/31	0/31	0/31
	#3.1 (Aquatic/ Terrestrial/ Hydrologic Resources)						
	Upper Spanish Fork Canyon	*<1 - 4/16*	--	--	--	--	--
	Willow Creek	*7 - 213/10,159*	--	--	--	--	--
	Strawberry Reservoir	*0/<1*	--	--	--	--	--
	White River	--	--	--	--	*0/206*	*2 – 48/898*
	# 3.3 Aquatic and Terrestrial Habitat						
	Upper Spanish Fork Canyon	*1 - 19/3,722*	--	--	--	*6 – 167/7,780*	*6 – 167/7,781*
	White River	--	--	--	--	*0/106*	*0/106*
	Nephi	*0/61*	--	--	*0/ 16*	*0/16*	*0/16*
	Mona	*0/31*	--	--	--	--	--
	# 4.4 Dispersed Recreation						
	Upper Spanish Fork Canyon	*5 – 151/1,974*	--	--	--	*1 – 32/294*	*1 – 32/294*
	Diamond Fork	*(<1) 4/37*	--	--	--	--	--
	Strawberry Reservoir	*0/52*	--	--	--	--	--
	# 4.5 Developed Recreation						
	Strawberry Reservoir	0/70	--	--	--	--	--
	#5.1 Forested Ecosystems – Ltd Dev't (Thistle)	0/1,007	--	--	--	0/1,007	0/1,007
	#5.2 Forested Ecosystems – Veg Mgt						
	Upper Spanish Fork Canyon	*0/23*	--	--	--	--	--
	Willow Creek	*0/<1*	--	--	--	--	--
	Strawberry Reservoir	*2 – 59 /1,285*	--	--	--	--	--

Table 3.14-13 Region II National Forest Management Area Impacts by Alternative

Jurisdiction	Description	Alternative II-A miles-acres 250-foot ROW/acres 2-mile corridor	Alternative II-B miles-acres 250-foot ROW/acres 2-mile corridor	Alternative II-C miles-acres 250-foot ROW/acres 2-mile corridor	Alternative II-D miles-acres 250-foot ROW/acres 2-mile corridor	Alternative II-E miles-acres 250-foot ROW/acres 2-mile corridor	Alternative II-F miles-acres 250-foot ROW/acres 2-mile corridor
Uinta National Forest (Continued)	#6.1 Non-Forested Ecosystems						
	Upper Spanish Fork Canyon	*3 – 90/4,966*	--	--	--	--	--
	Willow Creek	*0/98*	--	--	--	--	--
	#8.2 Utility Corridor/Communication Sites						
	Upper Spanish Fork Canyon	*<1 – 2/485*	--	--	--	*2 – 43/889*	*2 – 43/889*
	Willow Creek	*0/143*	--	--	--	--	--
	Strawberry Reservoir	*0/4*	--	--	--	--	--
	Mona	*0/7*	--	--	--	--	--
	Nephi	*0/30*	--	--	--	--	--
Manti-La Sal National Forest	Key Big-Game Winter Range	<1 – 8/295	--	--	--	<1 – 8/295	<1 – 8/295
	General Big-Game Winter Range	2 – 67/3,294	1 – 24/1,181	--	0/656	2 – 67/3,529	2 – 67/3,529
	Developed Recreation Sites[1]	--	<1 – 8/237	--	0/46	--	--
	Minerals Management Area	--	1 – 28/345	--	--	--	--
	Range Forage Production	0 – 3*/689	16 – 473/17,818	--	7 – 221/9,103	0 – 8/1,035	0 – 8*/1,035
	Utility Corridor	--	<1 – 1/329	--	0/43	--	--
	Wood Fiber Production and Utilization	--	0/1,362	--	1 – 30/906	--	--
	Special Land Designation[2]	--	--	--	0/21	--	--
	Research, Protection, and Interpretation of Lands and Resources	--	--	--	0/33	--	--
	Undeveloped Motorized Recreation Sites	--	--	--	0/129	--	--
	Watershed Protection/Improvement	--	0/327	--	--	--	--

Table 3.14-13 Region II National Forest Management Area Impacts by Alternative

Jurisdiction	Description	**Alternative II-A** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-B** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-C** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-D** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-E** miles-acres 250-foot ROW/acres 2-mile corridor	**Alternative II-F** miles-acres 250-foot ROW/acres 2-mile corridor
Fishlake National Forest	2B Rural and Roaded-Natural Recreation Opportunities	--	--	<1 – 15/1,390	--	--	--
	3A Semi Primitive Non-Motorized Recreation	--	--	0/98	--	--	--
	4A Fish Habitat Improvement	--	--	0/14	--	--	--
	4B Management Indicator Species	--	--	13 – 385/15,135	--	--	--
	5A Big Game Winter Range	--	--	2 – 65/2,766	--	--	--
	6B Livestock Grazing	--	4 – 116/4,129	10 – 287/16,360	--	--	4 – 116/4,129
	9F Improved Watershed Condition	--	--	4 – 124/5,055	--	--	--

[1] Indian Creek Campground under Alternative II-B, Flat Canyon Campground , Gooseberry Campground under Alternative II-D.

[2] Mammoth Guard Station

Table 3.14-14 Region II Alternative Route Land Use Impact Parameters

Jurisdiction/Impact Parameter	Description	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
	BLM (miles/ percent of alternative)	99/39%	208/60%	219/60%	146/56%	100/38%	124/46%
	White River	19	46	46	19	19	19
	Grand Junction	0	20	20	0	0	0
	Vernal	37	6	6	78	38	83
	Price	0	55	56	6	0	0
	Moab	0	60	60	0	0	0
	Richfield	1	5	14	1	1	1
	Salt Lake	0	0	0	0	0	4
	Fillmore	42	17	17	42	42	17
	Private (miles/ percent of alternative)	104/40%	76/22%	77/21%	71/27%	106/40%	79/30%
	State (miles/ percent of alternative)	28/11%	39/11%	40/11%	33/13%	30/11%	43/16%
	BIA/Tribal (miles/ percent of alternative)	0	0	0	3/1%	8/3%	3/1%
	USFS (miles/percent of alternative))	21/8%	23/7%	29/8%	9/3%	22/8%	18/7%
	Bureau of Reclamation	1/<1%	0	0	0	0	0
	URMCC	1/<1%	0	0	0	0	0
	Total (miles)	**257**	**345**	**364**	**262**	**266**	**267**
Colorado	Garfield	0	24	24	0	0	0
	Grand	0	68	68	0	0	0
	Mesa	0	12	12	0	0	0
	Moffat	24	1	1	24	24	24
	Rio Blanco	2	44	44	2	2	2
Utah	Carbon	0	0	0	45	<1	0
	Duchesne	52	0	0	34	60	54
	Emery	0	97	95	3	0	0
	Juab	52	33	0	44	47	37
	Millard	19	29	64	19	19	29
	Sanpete	9	30	0	28	9	9

Table 3.14-14 Region II Alternative Route Land Use Impact Parameters

Jurisdiction/Impact Parameter	Description	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Utah (Continued)	Sevier	0	0	50	0	0	0
	Uintah	50	6	6	64	53	64
	Utah	30	0	0	0	50	44
	Wasatch	20	0	0	0	2	5
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative)[2]	26/10%	142/41%	149/40%	73/28%	39/15%	69/26%
	Length within WWEC designated corridors (miles/percent of alternative)[3]	56/22%	34/10%	16/4%	49/19%	65/22%	30 /11%
	Total (miles/percent of alternative)	71/27%	142/41%	149/40%	104/40%	79/30%	82/30%
Co-location	Greenfield /Co-located mileage	32/225	156/189	156/208	151/110	45/222	121/146
Agricultural Lands	Additional ROW clearing and vegetation disturbance (acres)	452	169	238	82	286	104
	Construction disturbance (acres)	329	139	177	73	216	82
	Operation disturbance (acres)	92	51	49	28	66	32
	Number of center pivots crossed by reference line (count)	3	0	5	0	2	0
	Number of center pivots within Project corridor (count)	13	18	27	7	13	13
Livestock Grazing	Construction disturbance (acres)	1,728	4,018	4,229	2,922	1,804	2,800
	Estimated construction-related reduction to AUMs (AUMs/percent of total AUMs)[4]	86/<1%	201/<1%	211/<1%	146/<1%	90/<1%	140/<1%
	Operation disturbance (acres)	499	1,103	1,086	819	493	834
	Long-term reduction in AUMs (AUMs)[4]	25/<1%	55/<1%	54/<1%	41/<1%	25/<1%	42/<1%
Communities	Count of communities within 2-mile transmission line corridor	9	11	11	11	16	10
Structures within 500 feet of reference line	Residential (count)	53	5	4	6	35	13
	Commercial/Industrial (count)	31	17	12	1	20	0
	Agricultural (count)	0	0	3	0	0	0
	Outbuilding (count)	11	9	11	0	6	6
	Total (count)	**95**	**31**	**30**	**7**	**61**	**19**

Table 3.14-14 Region II Alternative Route Land Use Impact Parameters

Jurisdiction/Impact Parameter	Description	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Structures within 200 feet of reference line	Residential (count)	4	3	1	0	5	0
	Commercial/Industrial (count)	4	5	4	0	0	0
	Agricultural (count)	0	0	1	0	0	0
	Outbuilding (count)	1	1	3	0	1	4
	Total (count)	9	9	8	0	6	4

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

[4] The AUM decrease was calculated based on an average number of AUMs per acre for the grazing allotment acreage lost.

Note: Discrepancies in totals due to rounding error.

Table 3.14-15 Consistency in Region II with Applicable County or Municipal Land Use Plans and Policies

Regulating Agency	Plan, Policy, or Regulation	Allowed Uses in Agency Designated Land Management Districts Crossed by Proposed Project
Garfield County, Colorado	Garfield County Comprehensive Plan and Land Use Map, Unified Land Use Resolution	Land Use- no available spatial data Future Land Use – Agricultural Production/Natural Zoning - Rural district: Use Permitted Subject to Limited Impact Review.
Mesa County, Colorado	Mesa County Master Plan, Land Development Code	Land Use- no available spatial data Future Land Use –Rural Zoning - Agricultural, Forestry, Transitional district: aboveground transmission lines are subject to a Conditional Use permit.
Rio Blanco County, Colorado	Rio Blanco County Master Plan	Land Use- Agricultural, Residential, Low Density Future Land Use – Agricultural/Residential/Low Density Zoning - Agricultural district, Leisure Recreation (along White River) districts: Transmission lines in public ROWs shall not be subject to zoning requirements.
Carbon County, Utah	Carbon County Master Plan Carbon County Natural Resource Use and Management Plan Carbon County Zoning Ordinance	Land Use- oil and gas development, grazing Future Land Use – no available spatial data Zoning - Mining and Grazing (M&G), Watershed (WS), and Mountain Range (MR) zone; conditional use permit required for overhead electrical transmission lines over 69,000 volts; avoidance buffer of 100' from any drainage. County would require developers to maintain for public use all traditional access routes to public lands, streams, lakes, and waterways.
Duchesne County, Utah	Duchesne County General Plan Duchesne County Zoning Ordinance	Land Use- no available spatial data Future Land Use – no available spatial data Zoning - Agricultural districts: utility facilities are a permitted use.
Emery County, Utah	Emery County General Plan Emery County Zoning Ordinance	Land Use- no available spatial data Future Land Use – no available spatial data Zoning - Mining and Grazing; Agricultural; Mountain districts: Major utility transmission lines authorized by a Level 3 Conditional Use permit.
Grand County, Utah	Grand County General Plan Grand County Land Use Code	Land Use- no available spatial data Future Land Use – Transportation Resource; Range, Resource and Recreation Zoning - Range & Grazing district: transmission facilities authorized by a Conditional Use permit.
Juab County, Utah	Juab County General Plan Juab County Land Use Code Juab County Zoning Map	Land Use- no available spatial data Future Land Use – no available spatial data Zoning - Grazing, Mining, Recreation, & Forestry; Agriculture districts: transmission lines are a permitted use.

Table 3.14-15 Consistency in Region II with Applicable County or Municipal Land Use Plans and Policies

Regulating Agency	Plan, Policy, or Regulation	Allowed Uses in Agency Designated Land Management Districts Crossed by Proposed Project
Millard County, Utah	Millard County General Plan Millard County Zoning Ordinance and Map (2009b) Millard County Major Utility Corridor Map (2009a)	Land Use- no available spatial data Future Land Use – no available spatial data Zoning - Agricultural districts: transmission lines 140 kV or larger authorized by a Conditional Use permit. Unless directly associated with a "Electric Generating Facility" or "Wind Energy System (Major)" located in the County, all new "Electric Transmission Right-of-Way (Major)," "Gas Pipeline Right-of-Way (Major)," and "Petroleum Pipeline Right-of-Way (Major)" with an interstate or intrastate purpose shall be located within the "Westwide Energy Corridor," as identified by Millard County's Official Map, in compliance with all County Land Use Ordinances.
Sanpete County, Utah	Sanpete County General Plan Sanpete County Land Use Ordinance Sanpete County RMP Sanpete County Zoning Map	Land Use- Forest, Grassland, Woodland, Shrubland, Agriculture Future Land Use – no available spatial data Zoning – Agricultural , Sensitive Lands districts: Electric utility facilities authorized by a Conditional Use permit.
Sevier County, Utah	Sevier County General Plan Sevier County Zoning Ordinance Sevier County Zoning Map	Land Use- no available spatial data Future Land Use – no available spatial data Zoning - Grazing/Recreation/Forestry/Seasonal; Grazing/Recreation/Forestry/Residential, Agricultural districts: major utility distribution facilities are a permitted use.
Uintah County, Utah	Uintah County Zoning Ordinance (2005) Uintah County Land Use Plan (2010)	Land Use- Recreation, Forestry, and Mining; Mining and Grazing; Agricultural; Low Density Agricultural; Industrial; Industrial-Commercial Future Land Use – Recreation, Forestry, and Mining; Mining and Grazing; Agricultural; Low Density Agricultural; Industrial; Industrial-Commercial Zoning - Recreation, Forestry, and Mining district, Agriculture district, Light Industrial district. Transmission line or public utilities, with exception of substations, not specified as an allowable, special, or conditional use under any zoning district.
Utah County, Utah	Utah County General Plan Utah County Land Use Ordinance	Land Use- Agricultural/Watershed Future Land Use – no available spatial data Zoning - Mining and Grazing, Agricultural, Residential Agriculture districts: lines of 345 kV and over within a new transmission corridor require conditional use approval in any zoning district.
Wasatch County, Utah	Wasatch County General Plan Wasatch County Land Use and Development Code	Land Use- Grazing Future Land Use – Grazing Zoning - Preservation district: Electric utilities are a conditional use.

Table 3.14-15 Consistency in Region II with Applicable County or Municipal Land Use Plans and Policies

Regulating Agency	Plan, Policy, or Regulation	Allowed Uses in Agency Designated Land Management Districts Crossed by Proposed Project
City of Nephi, Utah	Nephi City Code	Land Use- no available spatial data Future Land Use – no available spatial data Zoning –Residential (R-1), Industrial/commercial (IC) and Highway/commercial (HC) zones: Transmission line or public utilities not specified as an allowable, special, or conditional use under any zoning district; public utility stations are a permitted use.
City of Helper, Utah	Helper City Code	Land Use- no available spatial data Future Land Use – no available spatial data Zoning – Industrial (I) and residential (R-1) districts: Transmission line or public utilities are a permitted use within the industrial zoning district, but are not specified as an allowable, special, or conditional use within the residential zoning district.
City of Mt. Pleasant	Mt. Pleasant City Code	Land Use- no available spatial data Future Land Use – no available spatial data Zoning – Residential-Agriculture (RA) and General Commercial (C-G) districts: Within RA districts, utilities (lines and ROWs only) are permitted uses. Within the C-G district, utilities lines are not specified as an allowable, special, or conditional use.
Roosevelt City	Roosevelt Municipal Code and Zoning Map	Land Use- no available spatial data Future Land Use – no available spatial data Zoning – Residential (R-1) and Rural Residential (RR-1): transmission lines are conditional uses.

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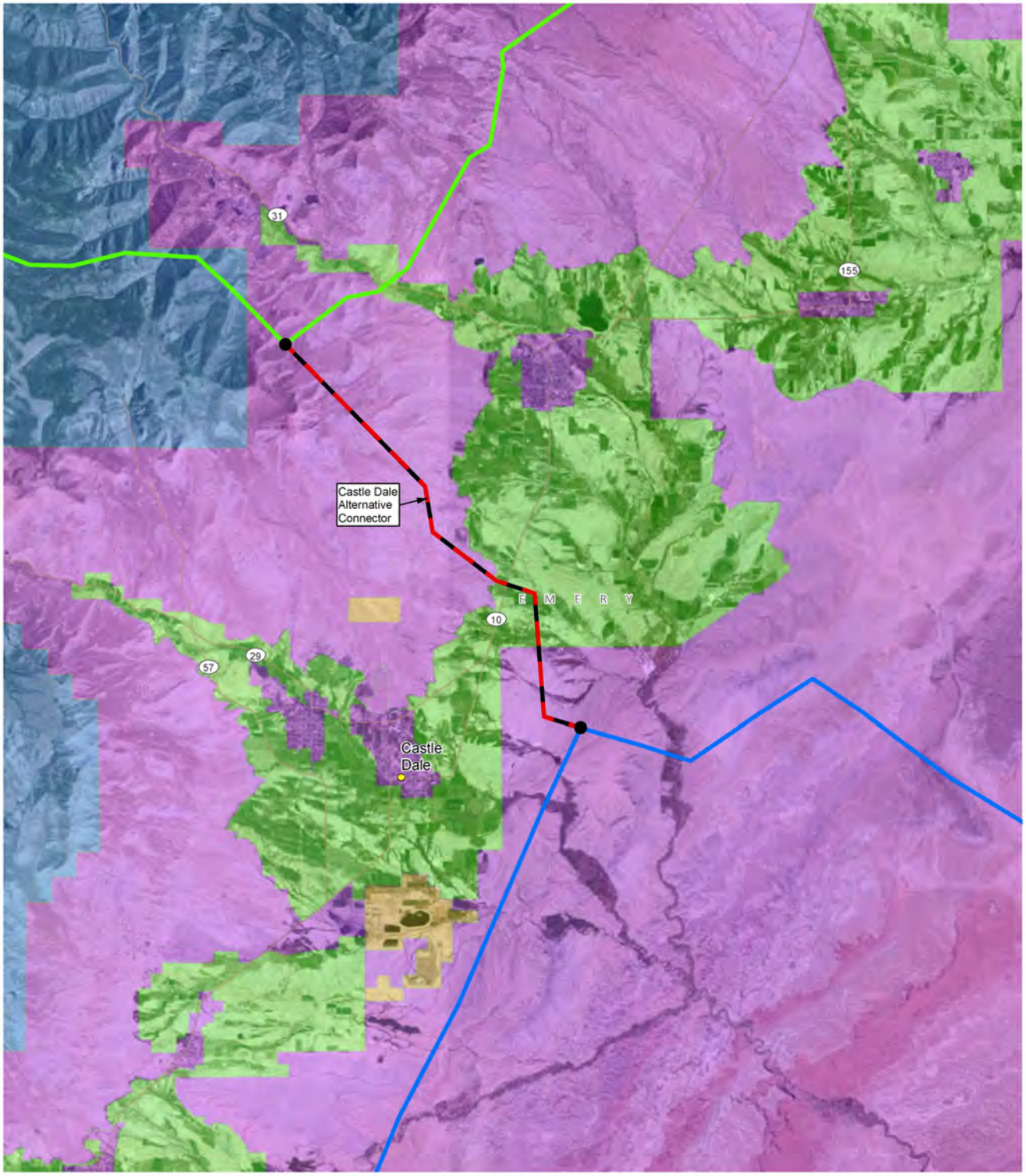

Node

DEIS Alternative Routes

- Alternative II-B
- Alternative II-C
- Alternative Variation or Connector

Emery County Zoning

- A-1, Agriculture
- I-1, Industrial
- M&G, Mining & Grazing
- M-1, Mountain

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-10
Region II
Zoning
Huntington to Castle Dale

0 0.75 1.5 3 Miles
0 0.75 1.5 3 km
1:190,000
N

Western AREA POWER ADMINISTRATION

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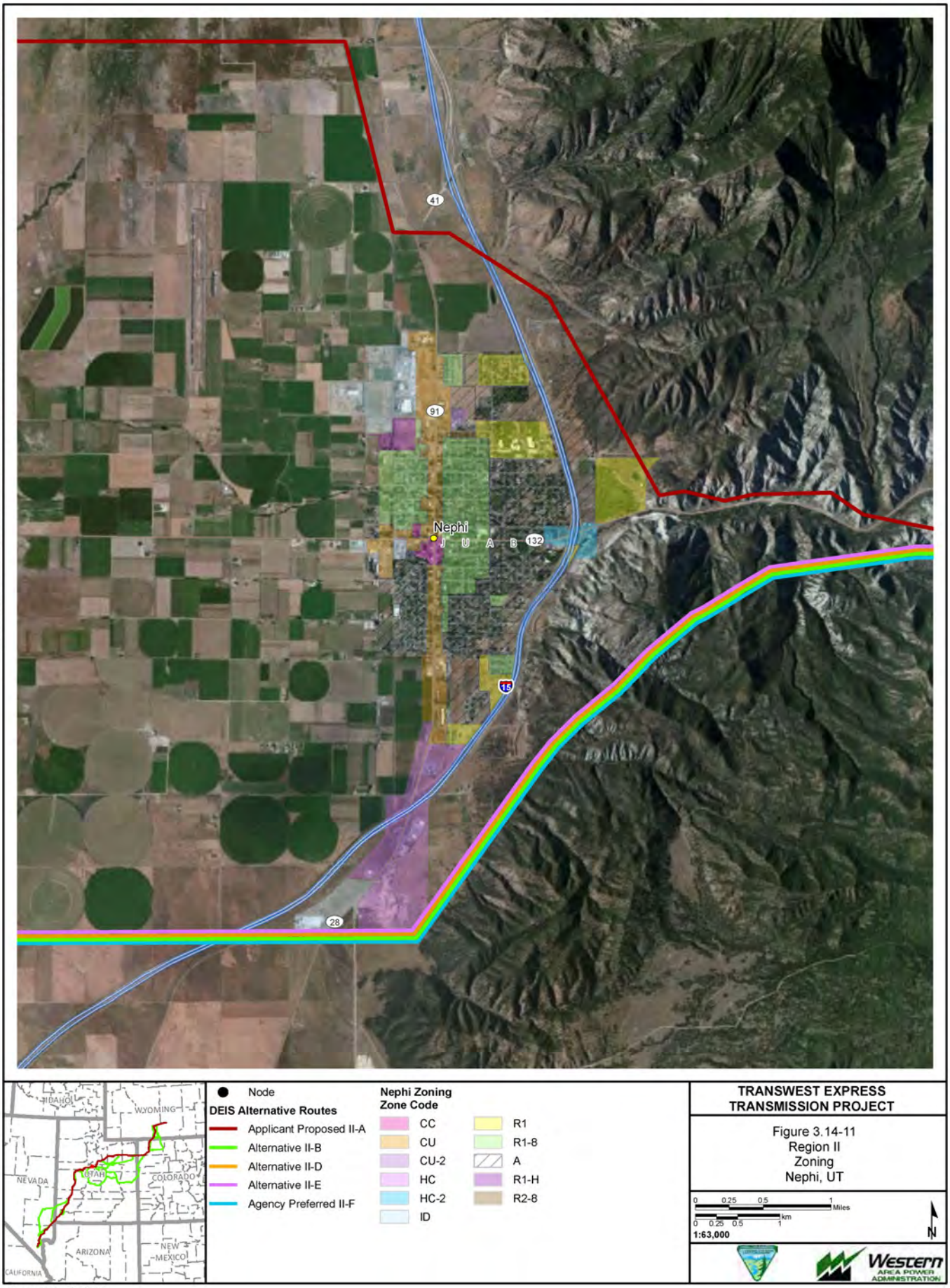

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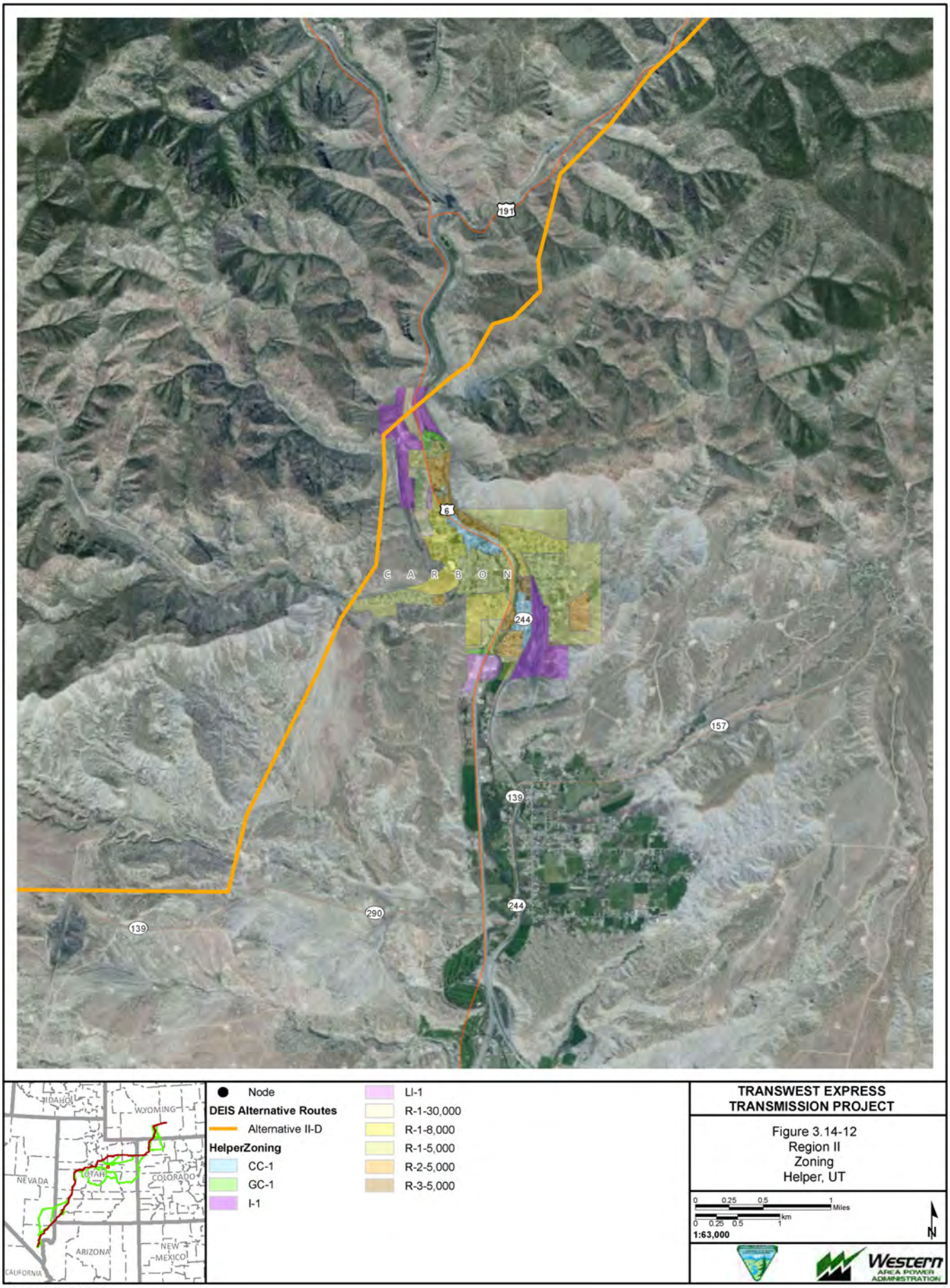

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-12
Region II
Zoning
Helper, UT

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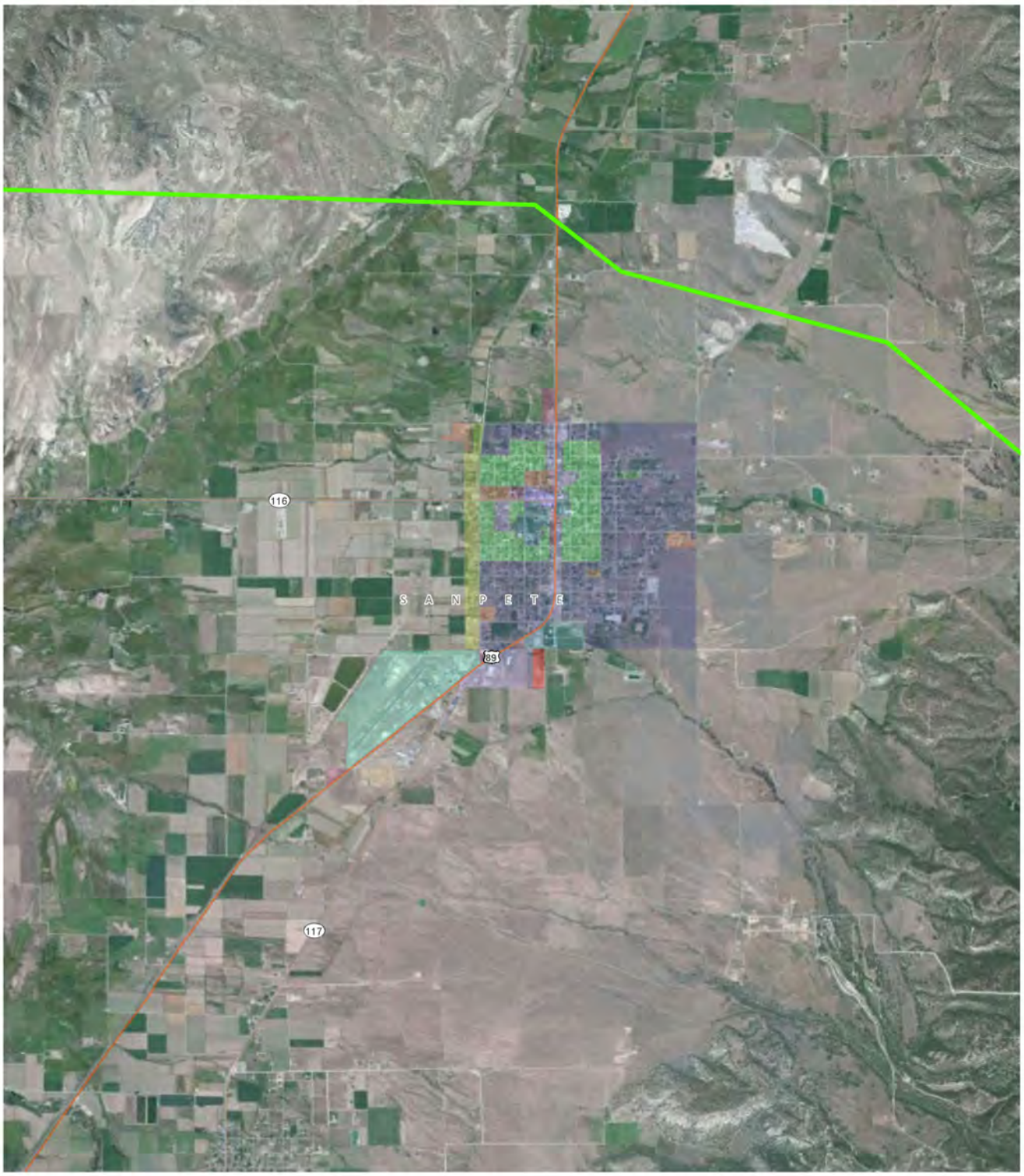

Node

DEIS Alternative Routes

Alternative II-B

Mount Pleasant Zoning

- CG, General Commercial
- CG/MOD, General Commercial Modified
- CH, Historic Commercial
- CM, Commercial Manufacturing
- CN, Neighborhood Commercial
- MP/PF, Manufacturing Park/Public Facility
- PF, Public Facility
- RA, Residential Agricultural
- RM, Multiple Residential
- RS, Single-Family Residential
- SL/AB, Sensitive Lands

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-13
Region II
Zoning
Mount Pleasant, UT

0 0.25 0.5 1 Miles
0 0.25 0.5 1 km
1:63,000

N

Western AREA POWER ADMINISTRATION

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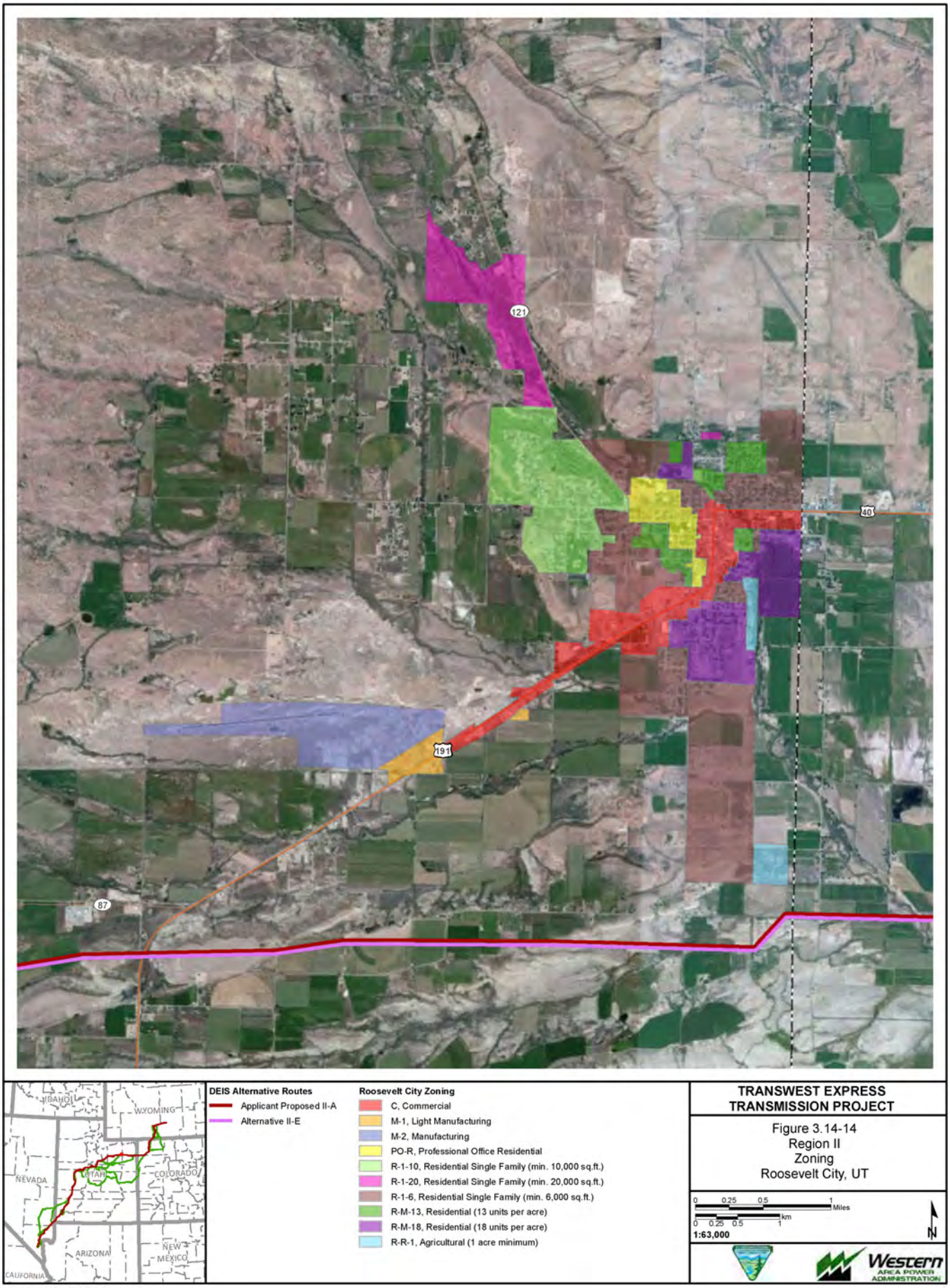

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-14
Region II
Zoning
Roosevelt City, UT

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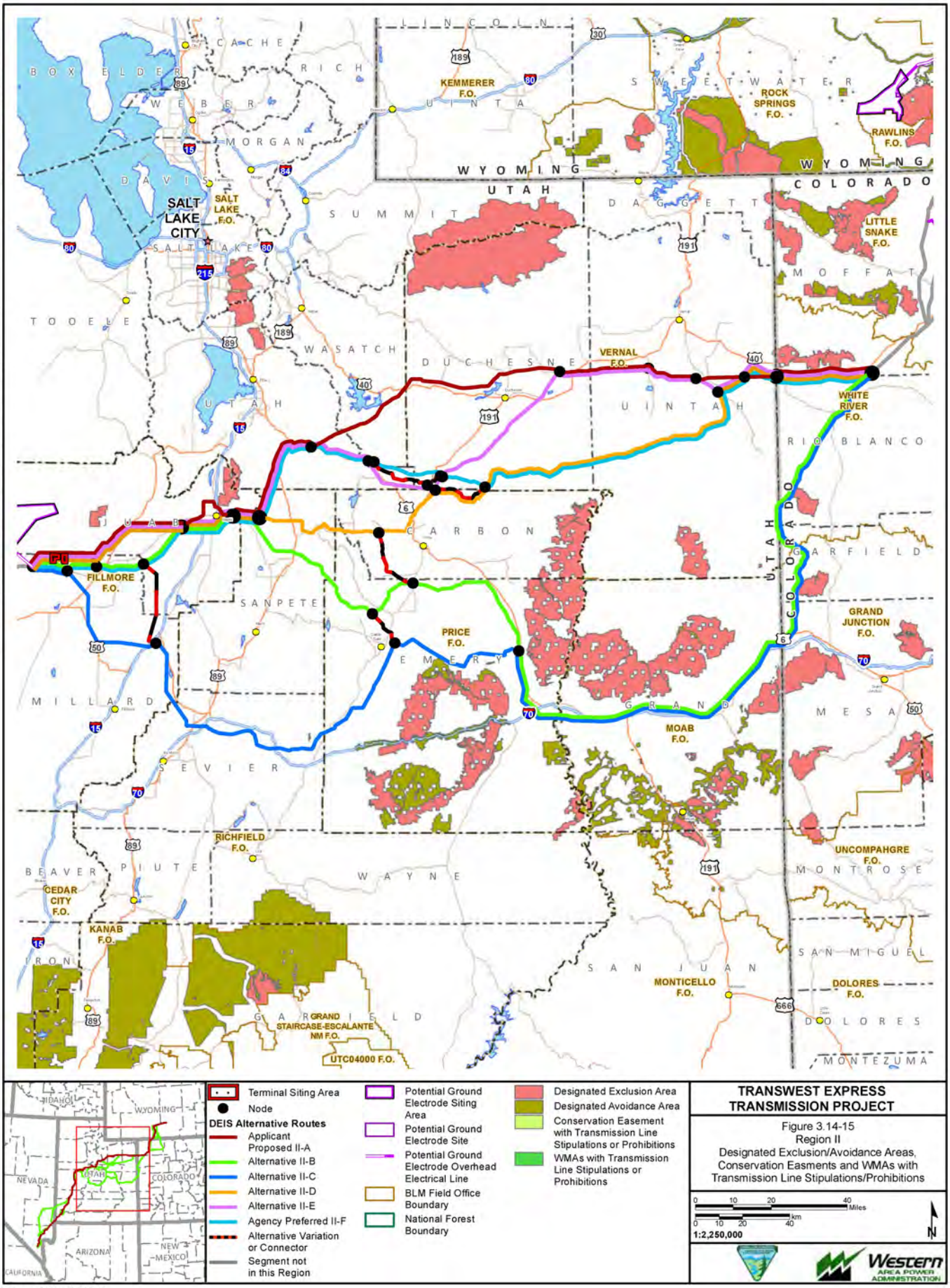

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Table 3.14-16 Avoidance and Exclusion Areas Crossed by Alternatives in Region II

Avoidance/ Exclusion	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Avoidance Areas	State WMA	NSO Area	NSO Area	State WMA	State WMA	State WMA
Reference Line Crossing Avoidance (total miles)	5	0	0	7	6	11
Exclusion Areas	Conservation easement	Demaree WSA	Demaree WSA	None	None	None
Reference Line Crossing Exclusion (total miles)	7	1	1	<1	0	0
Conservation easement or WMA transmission line restrictions	Currant Creek/Wildcat WMA[1] Sand Wash/Sink Draw conservation easement[2] North Nebo WMA – Spencer Fork Unit[3] South Nebo WMA – Triangle Ranch Unit[4] Strawberry WMA[1]	South Nebo WMA – Triangle Ranch Unit[4] North Nebo WMA – Moroni Unit[3]	N/A	Gordon Creek WMA[4] Northwest Manti WMA – Hilltop Unit[5] South Nebo WMA – Triangle Ranch Unit[4]	North Nebo WMA – Spencer Fork Unit[3] South Nebo WMA – Triangle Ranch Unit[4]	North Nebo WMA – Spencer Fork Unit[3] Northwest Manti WMA – Birdseye, Dairy Fork, Lake Fork, Starvation, and Wildcat Canyon Units South Nebo WMA – Triangle Ranch

[1] Mitigation for wildlife habitat during construction of Central Utah Project.

[2] Overhead transmission lines prohibited.

[3] Precludes industrial, commercial, or other development that is not consistent with the conservation values and purpose of the WMA.

[4] Land patent reversionary clauses on some parcels if land use changes from "big game management."

[5] Prohibits utilities, unless such structures or systems are necessary for permitted ranching operations or residential use.

Under Alternative II-A, approximately 104 miles (40 percent) would be located on private land. Alternative II-A would require 452 acres of additional ROW clearing, 329 acres of construction disturbance, and 92 acres of permanent removal of croplands. Three of the 13 center pivots within the 2-mile transmission line corridor would be crossed by the 250-foot-wide transmission line ROW.

An estimated 1,728 acres (86 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 499 acres (25 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

There would be 53 residences and 31 commercial building within 500 feet of the reference line. There would be 9 communities, 14 wildlife management areas, 1 state park, 1 BLM recreation area, 1 cemetery, 1 school, and 2 churches within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible land uses within these communities.

Under Alternative II-A, approximately 21 miles of the 250-foot-wide transmission line ROW would be within NFS lands with special management prescriptions; 19 miles within the Uinta National Forest and 2 miles within the Manti-LaSal National Forest.

Within the Uinta National Forest, the reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission corridor would pass through approximately 9 miles of areas specifically managed for aquatic and terrestrial resources and habitat (Prescription [Rx] 3.1 and 3.3); 5 miles of areas managed for dispersed recreation (Rx 4.4); 2 miles of areas managed for forested area vegetation management (Rx 5.2), 3 miles of area managed for non-forest ecosystems (Rx 6.1); and less than 1 mile of areas managed as utility corridor/communication sites (Rx 8.2). This mileage would be primarily located in the Upper Spanish Fork Canyon and Willow Creek management areas, with additional portions within the Strawberry Reservoir and Diamond Forks management areas. The Standards and Guidelines for each MA that are not addressed by TransWest Design Features are included in **Appendix C**, Section C-4 areas. With the exception of the Strawberry Reservoir Management Area, development of a transmission line would generally be compatible with all management areas (outside of primitive motorized and non-motorized ROS areas, which are discussed in Section 3.13, Recreation Resources), provided it does not inhibit attainment of objectives for the area. Within the Strawberry Reservoir Management Area, guidelines addressing greater sage-grouse specify the avoidance of sagebrush removal within 300 yards of greater sage-grouse foraging areas along riparian zones, meadows, lakebeds, and farmland, unless such removal is necessary to achieve greater sage-grouse habitat management objectives. The majority of acreage within the Strawberry Reservoir Management Area is not near greater sage-grouse foraging areas; however, there is a portion of concern (near the reservoir) in which the 2-mile transmission line corridor would pass (but not the reference line or 250-foot-wide transmission ROW). The following mitigation is suggested to address this impact:

LU-2*: Access roads and other construction facilities shall not be constructed in greater sage grouse foraging areas within the Strawberry Reservoir Management Area.*

Application of this mitigation would eliminate impacts to this management area.

TransWest's commitment for total stream and riparian area avoidance would reduce the potential for erosion and sedimentation that would impact the key resources within Rx 3.1. Section 3.4, Water Resources, contains additional information about impacts to water resources. Within Rx 3.3, habitat removal, noise and human activity would impact key resources. Agency timing stipulations and design features to avoid key resource habitat would reduce these impacts; Section 3.8, Special Status Wildlife Species, contains additional information about impacts to management indicator species. Within Rx 4.4, construction activities in particular would have impacts to dispersed recreation areas through visual and noise disturbances. Mitigation described in Section 3.13, Recreation (including timing restriction on construction), would reduce these impacts. Within Rx 5.2 and Rx 6.1, development of a transmission line is expected to have minimal impacts, provided restoration activities are successful (see Section 3.5, Vegetation) and access to motorized trails is not restricted (see Section 3.13, Recreation). Development of a transmission line would be fully compatible with Rx 8.2, which provides for utility corridors, subject to standards and guidelines for vegetation management to reduce visual impacts and the potential for erosion. Impacts to IRAs are discussed In Section 3.15, Special Designations.

Within the Uinta National Forest, the 2-mile transmission line corridor would encompass approximately 70 acres of areas managed as Developed Recreation areas (Rx 4.5), 1,007 acres of areas managed as forested ecosystems and limited development (Rx 5.1), 31 acres within an area managed as a Scenic Byway (Rx 2.5), and less than 1 acre within a wilderness management area (see Section 3.13, Recreation Resources, for impacts to designated Scenic Byways and Backways). As discussed in Section 3.15, Special Designation Areas, no access roads or construction would occur in wilderness areas. Development of access roads or other construction support areas would generally be compatible with Standards and Guidelines for these management areas. Strawberry Reservoir is an important developed recreation area in the immediate visual foreground of the Project. Alternative II-A would cross near the Strawberry Reservoir

management area on private lands near, but not within, areas managed to a “retention” visual quality objective. Visual impacts are discussed in Section 2.12.

Within the Manti-La Sal National Forest, approximately 2 miles of the reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission line corridor would fall within areas managed for General Big Game Winter Range, with less than 1 mile within areas managed as Key Big Game Winter Range. The Standard and Guidelines for each MA that are not addressed by TransWest Design Features included in **Appendix C**, Section C.4. Outside of primitive motorized and non-motorized ROS areas (discussed in Section 3.13, Recreation), development of a transmission line would generally be compatible with the management prescriptions for general big game winter range areas, provided vegetation densities are maintained and short term or temporary roads are obliterated within one season of use. Within key big game winter range areas, development of a transmission line would not be compatible with the management prescriptions for these areas unless construction occurs outside of the critical season, there is no long term degradation of habitat, and short term or temporary roads are fully restored. Agency timing stipulations and design features to avoid key resource habitat would reduce the impacts within these areas. Impacts to IRAs are discussed In Section 3.15, Special Designations.

Within the Manti-LaSal National Forest, the 2-mile transmission line corridor would encompass approximately 689 acres of areas managed for range forage production. Development of access roads or other construction support areas generally would be compatible with Standards and Guidelines for these areas.

The Cedar Knoll IRA micro-siting adjustments would not substantially affect the compatibility analysis for management areas as it would not change the acreage within the Strawberry Reservoir management area. Impacts to IRAs are discussed In Section 3.15, Special Designation Areas.

Alternative II-B

Approximately 67 percent of the 345-mile Alternative II-B route would be located on BLM or USFS-managed lands; an additional 11 percent would be located on state lands. Alternative II-B would have 134 miles in BLM-designated utility corridors, and 34 miles in the WWEC corridor. A total of 189 miles would be co-located with other ROWs. Designated avoidance areas would be crossed for less than 1 mile; designated exclusion areas would be crossed for less than 1 mile.

Under Alternative II-B, approximately 76 miles (22 percent) would be located on private land. Alternative II-B would require 169 acres of additional ROW clearing, 139 acres of construction disturbance, and 51 acres of permanent removal of croplands. No center pivots would be crossed by the 250-foot-wide transmission line ROW.

An estimated 4,018 acres (201 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 1,103 acres (55 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

There would be 5 residences and 17 commercial buildings within 500 feet of the reference line. There would be 11 communities, 3 wildlife management areas (WMAs), and 2 cemeteries within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible land uses within these communities; however, because this alternative would not be located within the WWEC in Millard County, it would be inconsistent with the goals, objectives and implementation strategies of the

Millard County General Plan and would require a General Plan and Utilities Corridor Map amendment prior to the approval of any required land use application(s). One WMA, South Nebo WMA —Triangle Ranch have land patent reversionary parcels if uses are not consistent with area goals. Compatibility with park management is further discussed in Section 3.13, Recreation.

Under Alternative II-B, approximately 23 miles of the 250-foot-wide transmission line ROW would be within national forest system lands with special management prescriptions; 19 miles within the Manti-La Sal National Forest and 4 miles within the Fishlake National Forest.

Within the Manti-La Sal National Forest, the reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission line corridor would pass through approximately 1 mile of area specifically managed for general big game winter range, 1 mile of area managed for mineral development, 16 miles range forage production areas, and less than 1 mile within designated utility corridors and developed recreation site management areas. **Appendix C**, Section C.4 contains the relevant Standard and Guidelines for each of the management areas. Compatibility with general big game winter range management areas is described under Alternative II-A. Within the minerals management and range forage production areas, development of a transmission line would generally be compatible with the management goals outside of primitive motorized and non-motorized recreation areas, provided that access to resources is not restricted. Development of a transmission line within areas managed for utility corridors would be fully consistent with the management goals for these areas. Application of **LU-1** would reduce impacts to each of these management areas through coordination with land managers on final structure placement, including all aboveground components, access roads, and permanent disturbance areas to eliminate the development of additional roads.

Construction of a transmission line would not be compatible with the management goals of developed recreation management areas within the Manti-LaSal National Forest and would have impacts to dispersed recreation areas through visual and noise disturbances. In particular, the Standard and Guidelines for this area restrict noise levels within management areas to 30 decibels or less except for noises generated by normal conservation and developed recreation activities. Under Alternative II-B, 8 acres of the Indian Creek Campground would be within the 250-foot-wide transmission line ROW and 237 acres within the 2-mile transmission line corridor. Application of **LU-1** would reduce impacts from the placement of aboveground components, access roads, and permanent disturbance areas; however, temporary transmission line construction activities in or near the campground would still result in noise levels about 30 A-weighted decibels (dBA). Section 3.13, Recreation, discusses impacts to recreation in greater detail and identifies additional mitigation measures to reduce this impact (***REC-5****: No construction shall be allowed after 5:00 p.m. on weeknights, and no construction shall be allowed on weekends, holidays, or the opening of big game hunting seasons in areas that are adjacent to developed recreation sites*).

Within the Manti-La Sal National Forest, additional portions of the 2-mile transmission line corridor also would fall within wood fiber production and utilization, and watershed improvement management areas. Development of access roads or other construction support areas would generally be compatible with the Standard and Guidelines for these areas; however, vehicular travel use may be restricted in areas where structural watershed improvements have been made (see **Appendix C**, Section C.4).

Within the Fishlake National Forest, 4 miles of the reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission line corridor would be within areas managed for livestock grazing. Development of a transmission line would generally be compatible with the Standard and Guidelines for this area; see **Appendix C**, Section C.4).

Alternative II-C

Approximately 68 percent of the 364-mile Alternative II-C route would be located on BLM or USFS-managed lands; 11 percent would be located on state lands. Alternative II-C would have 141 miles in BLM-designated utility corridors, and 16 miles in the WWEC corridor. A total of 208 miles would be co-located with other

ROWs. Designated avoidance areas would be crossed for less than 1 mile; designated exclusion areas would be crossed for 1 mile.

Under Alternative II-C, approximately 77 miles (21 percent) would be located on private land. Alternative II-C would require 238 acres of additional ROW clearing, 177 acres of construction disturbance, and 49 acres of permanent removal of croplands. Five of the 27 center pivots within the 2-mile transmission line corridor would be crossed by the 250-foot-wide transmission line ROW.

An estimated 4,229 acres (211 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 1,086 acres (54 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

Four residences and 12 commercial building would be within 500 feet of the reference line. There would be 11 communities, 2 wildlife management areas, and 1 cemetery within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible land uses within these communities; however, this alternative would not be within the WWEC in Millard County. This would be inconsistent with Millard County General Plan goals, objectives, and implementation strategies and would require a General Plan and Utilities Corridor Map amendment. Compatibility with park management and recreation opportunities is discussed in Section 3.13, Recreation.

Under Alternative II-C, approximately 29 miles of the 250-foot-wide transmission line ROW would be within Fishlake NFS lands with special management prescriptions.

The reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission line corridor would pass through approximately 13 miles of areas managed for management indicator species (4B), 10 miles through livestock grazing areas (6B), 4 miles through areas managed to improved watershed condition (9F), 2 miles managed for big game winter range (5A), and less than 1 mile through areas managed for rural and roaded-natural recreation opportunities (2B). Development of a transmission line generally would be compatible with Standard and Guidelines for this area (see **Appendix C**, Section C.4).

Within the 4B MIS and 5A Big Game Winter Range Management Areas, development of a transmission line generally would be compatible with the management goals outside of primitive motorized and non-motorized recreation areas, provided vegetation densities are maintained and short-term or temporary roads are obliterated within one season of use within big game winter range areas. Agency timing stipulations and design features to avoid key resource habitat such as big game winter range would reduce impacts within these areas. Section 3.7, Wildlife, contains additional information about impacts to management indicator species, big game, and big game winter range. Construction activities would have impacts to the recreation opportunities in some areas of the 2B Rural and Roaded Natural Recreation management areas through visual and noise disturbances, traffic delays, or trail access restrictions. Mitigation described in Section 3.13, Recreation Resources, (including timing restriction on construction) would reduce these impacts. TransWest's commitment for total stream and riparian area avoidance would reduce the potential for erosion and sedimentation that would impact the watersheds condition in the 9F Improve Watershed Condition management area. Section 3.4, Water Resources, contains additional information about impacts to water resources. Within the 6B Livestock Grazing management area, development of a transmission line would generally be compatible with the management goals, provided that access to resources is not restricted. Impacts to IRAs are discussed in Section 3.15, Special Designation Areas. Conformance with ROS classifications is discussed in Section 3.13, Recreation Resources.

Additional portions of the 2-mile transmission line corridor would also encompass 98 acres of 3A Semi-Primitive Non-Motorized Recreation and 14 acres of 4A Fish Habitat Improvement management areas. Development of access roads or other construction support areas would generally be compatible with Standard and Guidelines for these areas, provided that temporary roads are located outside of riparian areas within 4A Fish Habitat Improvement areas and are closed to public motorized use within 3A Semi-Primitive Non-Motorized Recreation areas.

The Cedar Knoll IRA micro-siting adjustments would not substantially affect the impact analysis for management areas.

Alternative II-D

Approximately 59 percent of the 262-mile Alternative II-D route would be located on BLM or USFS-managed lands. There would be 3 miles (1 percent) of the route located on tribal lands and an additional 13 percent would be located on state lands. Alternative II-D would have 73 miles in BLM-designated utility corridors, and 49 miles in the WWEC corridor. A total 110 miles would be co-located with other ROWs. Approximately 7 miles of avoidance areas would be crossed through state WMAs. Less than 1 mile of exclusion areas would be crossed.

Under Alternative II-D, approximately 71 miles (27 percent) would be located on private land. Alternative II-D would require 82 acres of additional ROW clearing, 73 acres of construction disturbance, and 28 acres of permanent removal of croplands. No center pivots would be crossed by the 250-foot-wide transmission line ROW.

An estimated 2,922 acres (146 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 819 acres (41 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

There would be 6 residences and 1 commercial building within 500 feet of the reference line. There would be 11 communities, 5 WMAs, 2 cemeteries, 1 church, and 2 schools within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). All three WMAs (Gordon Creek WMA, Northwest Manti WMA – Hilltop Unit, and South Nebo WMA – Triangle Ranch Unit) have prohibitions related to overhead utilities or land patent reversionary clauses if land use changes. Compatibility with park management and recreation opportunities is further discussed in Section 3.13, Recreation Resources. There are no identified incompatibilities with land uses within the communities; however, portions of the 2-mile transmission line corridor would overlap with the area identified for the Gooseberry Narrows Project, a proposed dam and reservoir south of Lower Gooseberry Reservoir along Gooseberry Creek, within the Manti-La Sal National Forest. The proposed project is supported by the objectives of the Sanpete County General Plan. **Figure 3.14-16** shows the location of the 250-foot-wide transmission line ROW and 2-mile transmission line corridor in relation to the proposed reservoir. Application of **LU-1** would reduce impacts by working with land managers to avoid road construction or other incompatible uses within the area proposed for the reservoir.

Under Alternative II-D, approximately 9 miles of the 250-foot-wide transmission line ROW would be within NFS lands with special management prescriptions within the Manti-La Sal National Forest. The reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission line corridor would pass through approximately 7 miles of areas managed for range forage production, and 1 mile of areas managed for wood fiber production and utilization. **Appendix C**, Section C.4 contains the relevant Standard and

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Node

DEIS Alternative Routes

Alternative II-D

Gooseberry Narrows Project

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-16
Region II
Gooseberry Narrows Project

0 0.25 0.5 1 Miles
0 0.25 0.5 1 km
1:63,000

N

Western AREA POWER ADMINISTRATION

Exported On: 4/23/2013

Guidelines for each of the management areas. Compatibility with range forage production is described under Alternative II-B. Within wood fiber production and utilization areas, development of a transmission line would generally be compatible with the management goals outside of primitive motorized and non-motorized recreation areas, provided that access to timber resources is not restricted (see Section 3.5, Vegetation, for impacts to these resources). Impacts to IRAs are discussed in Section 3.15, Special Designation Areas. Conformance with ROS classifications is discussed in Section 3.13, Recreation Resources.

The 2-mile transmission line corridor would also encompass additional acreage within the Uinta, Manti-La Sal, and Ashley national forests. Within the Uinta National Forest, 31 acres of the 2-mile transmission line corridor would fall within an area managed as a scenic byway and 16 acres would fall within areas managed for aquatic and terrestrial habitat. Consistency with the management of these areas would be the same as under Alternative II-A.

Within the Manti-La Sal National Forest, additional portions of the 2-mile transmission line corridor would fall within Developed Recreation Sites (specifically, the Flat Canyon and Gooseberry Campgrounds); Special Land Designation (the Mammoth Guard Station); Research, Protection, and Interpretation of Lands and Resource; and Undeveloped Motorized Recreation Sites management areas. With the exception of the Developed Recreation Sites, development of access roads or construction support areas would generally be compatible with these management areas, provided it does not inhibit attainment of objectives for the area. Construction of access roads or other support facilities would not be compatible with the management goals of developed recreation management areas and would have impacts to dispersed recreation areas through visual and noise disturbances. This issue is further discussed in Section 3.13, Recreation, and would be mitigated through application of **REC-5**, which would impose timing restraints on construction activities to reduce these noise impacts.

Within the Ashley National Forest, portions of the 2-mile transmission line corridor (and a very small portion of the 250-foot-wide transmission line ROW) would fall within areas managed for livestock grazing (D) and wildlife habitat (E) emphasis. Portions of the 2-mile transmission line corridor also would fall within areas with low management emphasis (N). Development of access roads and support facilities within livestock grazing areas generally would be compatible with the management goals (see **Appendix C**, Section C.4). Within the wildlife habitat emphasis, development of a transmission line would be compatible with the management goals, provided that key stress seasons are avoided, short term or temporary roads are reclaimed for wildlife use and riparian areas are protected (see **Appendix C**, Section C.4). Agency timing stipulations and design features to avoid key resource habitat such as big game winter range during key seasons and total avoidance of riparian habitat would reduce these impacts within these areas. Section 3.7, Wildlife Resources, contains additional information about impacts to management indicator species, big game and big game winter range. Impacts to IRAs are discussed In Section 3.15, Special Designations. Conformance with ROS classifications is discussed in Section 3.13, Recreation.

Alternative II-E

Approximately 46 percent of the 266-mile Alternative II-E route would be located on BLM or USFS-managed lands; an additional 11 percent would be located on state lands and 3 percent would be located on tribal lands. Thirty-nine miles of Alternative II-E would be in BLM-designated utility corridors, and 65 miles in the WWEC corridor. A total of 222 miles would be co-located with other ROWs. Approximately 6 miles of avoidance areas would be crossed through state WMAs. No exclusion areas would be crossed.

Under Alternative II-E, approximately 106 miles (40 percent) would be located on private land. Alternative II-E would require 286 acres of additional ROW clearing, 216 acres of construction disturbance, and 66 acres of permanent removal of croplands. Two of the 13 center pivots within the 2-mile transmission line corridor would be crossed by the 250-foot-wide transmission line ROW.

An estimated 1,804 acres (90 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 493 acres (25 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

There would be 35 residences and 20 commercial building within 500 feet of the reference line. The majority of the commercial/industrial structures are oil and gas pads. Land use conflicts with oil and gas structures would be addressed by maintenance of requisite buffers between well pads and transmission line. Gathering systems or pad access roads within the area are not included in the above “structure” count. Application of **LU-1** would reduce impacts by working with land managers to avoid road construction or other incompatible uses within areas used for oil and gas development.

There would be 16 communities, 1 local park, 11 WMAs, 2 cemeteries, and 2 churches that are within the 2-mile transmission line corridor in Region II (see Section 3.18, Public Health and Safety). There are no identified incompatible land uses within these communities. Compatibility with WMA management and recreation opportunities is discussed in Section 3.13, Recreation.

Under Alternative II-E, approximately 22 miles of the 250-foot-wide transmission line ROW would be within NFS lands with special management prescriptions within the Manti-La Sal, Uinta, and Ashley national forests.

Within the Manti-La Sal National Forest, impacts to management units and consistency with applicable standards and guidelines would be similar to Alternative II-A, but would be slightly more than Manti-La Sal National Forest acreage within the general big game winter range, and range forage production areas would be included within the 2-mile transmission line corridor.

Within the Uinta National Forest, impacts to management units and consistency with applicable standards and guidelines would be the similar to Alternative II-A, but would include no mileage of 250-foot-wide transmission line ROW within Rx 3.1 (aquatic/terrestrial hydrologic resources), 5 more miles within areas managed for terrestrial resources (Rx 3.3) and habitat, and 4 fewer miles in areas managed for dispersed recreation (Rx 4.4). Within the Ashley National Forest, the reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission line corridor would pass through approximately 9 miles of areas with a low management emphasis (N) and 1 mile of area managed for dispersed roaded recreation (F). Development of a transmission line within these areas generally would be compatible with management goals outside of any primitive motorized and non-motorized recreation areas (see **Appendix C**, **Section C-4** for standards and guidelines). Impacts to IRAs are discussed in Section 3.15, Special Designation Areas. Conformance with ROS classifications is discussed in Section 3.13, Recreation Resources.

The Cedar Knoll IRA micro-siting adjustments would not substantially affect the impact analysis for management areas.

Alternative II-F (Agency Preferred)

Approximately 53 percent of the 267-mile Alternative II-F route would be located on BLM or USFS-managed lands; an additional 16 percent would be located on state lands and 1 percent would be located on tribal lands. Sixty-eight miles of Alternative II-F would be in BLM-designated utility corridors, and 30 miles in the WWEC corridor. A total of 146 miles would be co-located with other ROWs. Approximately 11 miles of avoidance areas would be crossed through state WMAs. No exclusion areas would be crossed.

Under Alternative II-F, approximately 79 miles would be located on private land. This alternative would require 104 acres of additional ROW clearing, 82 acres of construction disturbance, and 32 acres of permanent removal of croplands. Zero of the 13 center pivots within the 2-mile transmission line corridor would be crossed by the 250-foot-wide transmission line ROW.

An estimated 2,800 acres (140 AUMs) would be removed from grazing allotments due to construction-related surface disturbance. Once construction is complete, areas not required for operation would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 834 acres (42 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of the total available AUMs on these allotments.

There would be 13 residences within 500 feet of the reference line. Alternative II-F would cross 99 communication sites, 10 communities, 7 parks (includes four wildlife management areas), 2 cemeteries, and 1 church that are within the 2-mile transmission corridor in Region II.

Under Alternative II-F, approximately 18 miles of the 250-foot-wide transmission line ROW would be within NFS lands with special management prescriptions within the Ashley, Fishlake, Uinta, and Manti-La Sal national forests. Impacts to management units and consistency with applicable standards and guidelines within the Uinta and Manti-La Sal national forests would be the same as under Alternative II-D. Impacts to management units and consistency with applicable standards and guidelines within the Fishlake National Forest would be the same as under Alternative II-B.

Within the Ashley National Forest, the 250-foot-wide transmission line ROW would pass through areas managed for livestock grazing (D), wildlife habitat emphasis (E), dispersed recreation-roaded (F), and low management emphasis (N). Impacts to management units and consistency with applicable standards and guidelines for livestock grazing (D), dispersed recreation-roaded (F), and low management emphasis (N) are described under to Alternative II-D. Consistency with wildlife habitat emphasis (E) is described under Alternative II-D.

The Cedar Knoll IRA micro-siting option would not substantially affect the impact analysis results for land use. Impacts to IRAs are discussed in Section 3.15, Special Designation Areas.

Alternative Variations in Region II

The land ownership crossed by the alternative variations and other key impact parameters are summarized in **Table 3.14-17**.

Table 3.14-17 Impact Parameters of Alternative Variation Alternatives in Region II

Impact Parameter	Description	Emma Park Alternative Variation	Comparable Portions of Alternative II-F
Jurisdiction	BLM (miles)	5	10
	Price	1	0
	Salt Lake	3	4
	Vernal	<1	6
	Private (miles)	26	19
	USFS (miles)	0	2
	State (miles)	4	1
	Total (miles)	**35**	**32**

Table 3.14-17 Impact Parameters of Alternative Variation Alternatives in Region II

Impact Parameter	Description	Emma Park Alternative Variation	Comparable Portions of Alternative II-F
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative)[2]	<1/2%	0/0%
	Length within WWEC designated corridors (miles/percent of alternative)[3]	0/0%	0/0%
	Total (miles/percent of alternative)	**<1/<1%**	**0/0%**
Co-location	Greenfield/Co-located (mileage)	35/0	32/0
Avoidance/Exclusion Areas Crossed	Avoidance (miles)	0	0
	Exclusion (miles)	0	0
	Description	N/A	-
Agricultural Lands	Additional ROW clearing and vegetation disturbance (acres)	4	0
	Construction disturbance (acres)	3	0
	Operation disturbance (acres)	1	0
Livestock Grazing	Construction Disturbance (acres)	280	435
	Estimated decreased AUMs (AUMs/percent of total AUMs)[4]	14/<1%	22/<1%
	Operational Disturbance (acres)	98	160
	Long-term decreased AUMs (AUMs/percent of total AUMs)[4]	5/<1%	8/<1%
Structures within 500 feet of reference line	Residential (count)	0	11
	Commercial/Industrial (count)	0	0
	Agricultural (count)	0	0
	Outbuilding (count)	0	2
	Total (count)	**0**	**13**
Structures within 200 feet of reference line	Residential (count)	0	0
	Commercial/Industrial (count)	0	0
	Agricultural (count)	0	0
	Outbuilding (count)	0	5
	Total (count)	**0**	**5**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

[4] The AUM decrease was calculated based on an average number of AUMs per acre for the grazing allotment acreage lost.

Note: Discrepancies in totals due to rounding.

Alternative Connectors in Region II

The land ownership of land crossed by the alternative connectors and other key impact parameters are summarized in **Table 3.14-18**. The Lynndyl, Castle Dale, Price and Highway 191 alternative connectors would utilize portions of BLM-designated corridors. The IPP East Alternative Connector would utilize a portion of the WWEC designated corridor. The Lynndyl, IPP East, Price, and Highway 191 alternative connectors present no disturbance to private agriculture lands, whereas the Castle Dale Alternative Connector would present some disturbance to private agriculture land. Impacts to livestock grazing allotments would be slightly greater with the addition of any combination of the alternative connectors. The Highway 191 Alternative Connector would have the least impacts on grazing.

Table 3.14-18 Impact Parameters of Region II Alternative Connectors

Impact Parameter	Description	Lynndyl Alternative Connector	IPP East Alternative Connector	Castle Dale Alternative Connector	Price Alternative Connector	Highway 191 Alternative Connector
Jurisdiction	BLM (miles)	9	3	2	5	0
	Fillmore	9	3	--	--	--
	Price	--	--	2	5	--
	Private (miles)	15	0	4	4	2
	State (miles)	0	0	4	10	3
	US Forest Service (miles)	<1	0	--	--	0
	Total (miles)	**24**	**3**	**11**	**18**	**5**
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative)[2]	1/3%	0	2/18%	4/23%	0/0%
	Length within WWEC designated corridors (miles/percent of alternative)[3]	0	<1/13%	0	0	0/0%
	Total (miles/percent of alternative)	**1/3%**	**<1/13%**	**2/18%**	**4/23%**	**0/0%**
Co-location	Greenfield/Co-located mileage	20/4	0/3	0/11	4/14	5/0
Avoidance/ Exclusion Areas Crossed	Avoidance (miles)	0	0	0	3	0
	Exclusion (miles)	0	0	0	0	0
	Description	N/A	N/A	N/A	Gordon Creek WMA	N/A
Agriculture		No disturbance to agriculture lands due to clearing, construction, or removal of croplands.	No disturbance to agriculture lands due to clearing, construction, or removal of croplands.	16 acres of additional ROW clearing, 16 acres of construction disturbance, 6 acres of permanent removal of croplands.	No disturbance to agriculture lands due to clearing, construction, or removal of croplands.	No disturbance to agriculture lands due to clearing, construction, or removal of croplands.
Livestock Grazing		Construction impacts 178 acres (9 AUMs); Operation impacts 42 acres (2 AUMs)	Construction impacts 36 acres (2 AUMs); Operation impacts 7 acres (<1AUM)	Construction impacts 108 acres (5 AUMs); Operation impacts 30 acres (1 AUM)	Construction impacts 232 acres (12 AUMs); Operation impacts 67 acres (3 AUMs)	Construction impacts 20 acres (1 AUM); Operation impacts 10 acres (<1 AUM)
Structures within 500 feet of reference line	Residential (count)	0	0	0	0	0
	Commercial/Industrial (count)	1	0	0	0	0
	Agricultural (count)	0	0	0	0	0
	Outbuilding (count)	0	0	0	0	1
	Total	**1**	**0**	**0**	**0**	**1**

Table 3.14-18 Impact Parameters of Region II Alternative Connectors

Impact Parameter	Description	Lynndyl Alternative Connector	IPP East Alternative Connector	Castle Dale Alternative Connector	Price Alternative Connector	Highway 191 Alternative Connector
Structures within 200 feet of reference line	Residential (count)	0	0	0	0	0
	Commercial/Industrial (count)	0	0	0	0	0
	Agricultural (count)	0	0	0	0	0
	Outbuilding (count)	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

Note: Discrepancies in totals due to rounding.

The Lynndyl Connector would utilize portions of Fishlake NFS lands managed for livestock grazing. Consistency with area management is discussed under Alternative II-C.

Region II Conclusion

Alternatives II-A, II-B, II-C, II-D, II-E, and II-F have similar impacts to most of the parameters discussed. Alternative II-D would utilize the greatest amount of designated corridors (104 miles and 40 percent of the route), whereas Alternative II-F would utilize 82 miles (30 percent of the route) and Alternative II-A would utilize the fewest (71 miles and 27 percent of the route). Alternative II-A has the greatest amount of co-located mileage (225) and Alternative II-D has the fewest (110). Alternative II-A would create the greatest disturbance to agricultural lands and Alternative II-D would create the fewest. Alternatives II-B and II-C would have the least impact to Avoidance and Exclusion Areas, both crossing 1 mile of the Demaree WSA. Livestock grazing impacts would be fairly similar between the applicant preferred route and the agency preferred alternative in Region II. Acreage-wise, the greatest impacts would occur on Alternative II-C, and the fewest on Alternative II-A. For all routes, reclamation in the Uintah Basin would also be difficult due to soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, specifically halogeton. Additionally, reclamation in the San Rafael Swell area, specifically, along Alternative II-B, and II-C, would be difficult due to soil reclamation constraints, and low regional annual precipitation rates. If successful reclamation is not achieved, restoration of livestock grazing on disturbed lands would not occur. The spread of halogeton is of particular concern as it is toxic to sheep and cattle in larger doses.

Impacts related to the Strawberry IRA and Cedar Knoll IRA micro-siting options would differ only slightly. Strawberry Micro-siting Option 3 would be located within 18 miles (24 percent of the route) of a designated corridor compared to the 15 miles (20 percent of the route) for the other micro-siting options. The Emma Park Alternative Variation adds 3 miles to the comparable route. Mileage through BLM and USFS lands are reduced and the variation adds mileage to private and state lands that results in impacts to agricultural lands through ROW clearing, construction, and permanent facilities. No mileage from the reference line or the 250-foot-wide transmission line ROW would cross NFS lands. There would be a total of 1 acre of the 2-mile transmission line corridor that would overlap with the Uinta National Forest area managed for aquatic/terrestrial hydrologic resources (Rx 3.1). The development of a transmission line corridor generally would be compatible with management objectives in this area. Compared to the portion of Alternative II-F that this variation would replace, there would be 1.6 fewer miles crossed and 48 fewer acres overlapped by the 250-foot-wide transmission line ROW within Rx 3.1 in the Uinta National Forest. The same comparison within the Ashley National Forest would result in 0.9 fewer miles crossed and 30 fewer acres overlapped by the 250-foot-wide transmission line ROW within livestock grazing (D), dispersed recreation-roaded (F), and low management emphasis (N) management areas.

The alternative connectors in Region II include the Lynndyl, IPP East, Castle Dale, Highway 191, and Price connectors. In most respects their impacts would be similar. The Lynndyl Alternative Connector is the longest of the Region II connectors and would utilize the least amount of designated corridors (1 mile/3 percent). The Castle Dale Alternative Connector is the only Region II connector that would require disturbance to agricultural lands.

In general, all alternatives would be in compliance with the standards and guidelines for most of the management areas crossed by the transmission line. The exceptions are a portion of greater sage-grouse foraging habitat within the Strawberry Reservoir Management Area (Alternative II-A), the Indian Creek Campground developed recreation Management Area (Alternative II-B), and the Flat Canyon and Gooseberry Campground developed recreation Management Areas (Alternative II-D). Proposed mitigation would eliminate construction within the greater sage-grouse foraging habitat within the Strawberry Reservoir Management Area, allowing Alternative II-A to remain in compliance with the standards and guidelines for all Management Areas. Proposed mitigation to restrict the timing and location of construction within the developed recreation Management Areas crossed by Alternative II-B and II-D would reduce, but not fully eliminate impacts to these areas.

3.14.6.5 Region III

The reference lines under all action alternatives in Region III cross BLM and USFS lands and state-owned lands in Utah (**Figure 2-14**). USFS lands are located in the Dixie National Forest in Utah. The BIA/Tribal lands crossed by Alternative III-B include a portion of the Moapa River Indian Reservation southwest of Moapa. Residential uses in the vicinity of Moapa are mixed with croplands. **Table 3.14-19** summarizes impact parameters for each alternative in Region III.

Table 3.14-19 Region III Alternative Route Land Use Impact Parameters

Impact Parameter	Description	Alternative III-A	Alternative III-B	Alternative III-C
Jurisdiction	BLM (miles/percent of alternative)	208/75%	212/75%	238/77%
	Fillmore	70	70	69
	Cedar City	42	37	37
	St. George	25	0	0
	Caliente	22	67	90
	Las Vegas	50	37	41
	USFS (Dixie National Forest)	16/6%	0	0
	Bureau of Indian Affairs/Tribal	0	14/5%	0
	State	14 /5%	11/3%	10/3%
	Private	38/14%	48/17%	61/20%
	Total (miles)	**276**	**285**	**308**
State	**County**			
Utah	Beaver	32	33	33
	Iron	46	56	56
	Millard	76	76	74
	Washington	48	0	0
Nevada	Clark	51	51	47
	Lincoln	22	68	99
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative)[2]	68/25%	65/23%	41/13%
	Length within WWEC designated corridors (miles/percent of alternative)[3]	153/55%	77/27%	45/15%
	Total (miles/percent of alternative)	**170/62%**	**127/45%**	**80/26%**
Co-location	Greenfield/Co-located mileage	73/203	140/145	96/213
Dixie National Forest miles-acres 250-foot ROW /acres 2-mile corridor	1 General Management Area	3 – 102/9,558	--	--
	2B Roaded Natural Recreation	2 – 57/1,458	--	--
	4C Wildlife Habitat (Shrub Areas)	0/1,613	--	--
	5A Big Game Winter Range	5 – 148/5,216	--	--
	6A Livestock Grazing	7 – 223/5,958	--	--
Agricultural Lands	Additional ROW clearing and vegetation disturbance (acres)	0	14	4
	Construction disturbance (acres)	0	9	4
	Operation disturbance (acres)	0	2	0
	Number of center pivots crossed by reference line (count)	0	0	0
	Number of center pivots within Project corridor (count)	12	4	4

Table 3.14-19 Region III Alternative Route Land Use Impact Parameters

Impact Parameter	Description	Alternative III-A	Alternative III-B	Alternative III-C
Livestock Grazing	Construction disturbance (acres)	3,552	3,211	3,533
	Estimated decreased construction-related reductions (AUMs/percent of total AUMs)[4]	178/<1%	161/<1%	177/<1%
	Operation disturbance (acres)	970	791	866
	Long-term decreased reductions (AUMs)[4]	49/<1%	40/<1%	43/<1%
Communities	Count within 2-mile transmission line corridor	2	8	9
Structures within 500 feet of reference line	Residential (count)	7	2	2
	Commercial/Industrial (count)	7	6	7
	Agricultural (count)	1	0	1
	Outbuilding (count)	10	9	10
	Total (count)	**25**	**17**	**20**
Structures within 200 feet of reference line	Residential (count)	2	1	1
	Commercial/Industrial (count)	3	3	4
	Agricultural (count)	0	0	0
	Outbuilding (count)	4	4	4
	Total (count)	**9**	**8**	**9**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

[4] The AUM decrease was calculated based on an average number of AUMs per acre for the grazing allotment acreage lost.

Note: Discrepancies in totals due to rounding.

Alternatives III-A, III-B, and III-C cross through counties listed in **Table 3.14-20**. Existing and future land use spatial data, in a digital or paper map format, were not available for all counties in the region. This is because the majority of unincorporated lands outside of municipal areas are federal or state lands; or because the zoning designations describe the existing/planned/future land use. Most of the affected counties allow for the development of large transmission lines and associated facilities through zoning districts. Two counties require review by the board of county commissioners. Four counties require a Conditional Use or other type of permit or review. The development of transmission lines is not addressed in all zoning ordinances. These counties would require a consultation with the county planning agency to determine the procedure for permitting the proposed Project.

Table 3.14-20 Consistency with Applicable Land Use Plans and Policies in Region III

Regulating Agency	Plan, Policy, or Regulation	Allowed Uses in Agency Designated Land Management Districts Crossed by Proposed Project
Beaver County, Utah	Beaver County General Plan Beaver County Zoning Ordinance	Land Use- spatial data not available Future Land Use – spatial data not available Zoning – Multiple Use district: Electric transmission line is a conditional use.
Iron County, Utah	Iron County Zoning Ordinance	Land Use- spatial data not available Future Land Use – spatial data not available Zoning - Agriculture district: Electric transmission line is a conditional use.

Table 3.14-20 Consistency with Applicable Land Use Plans and Policies in Region III

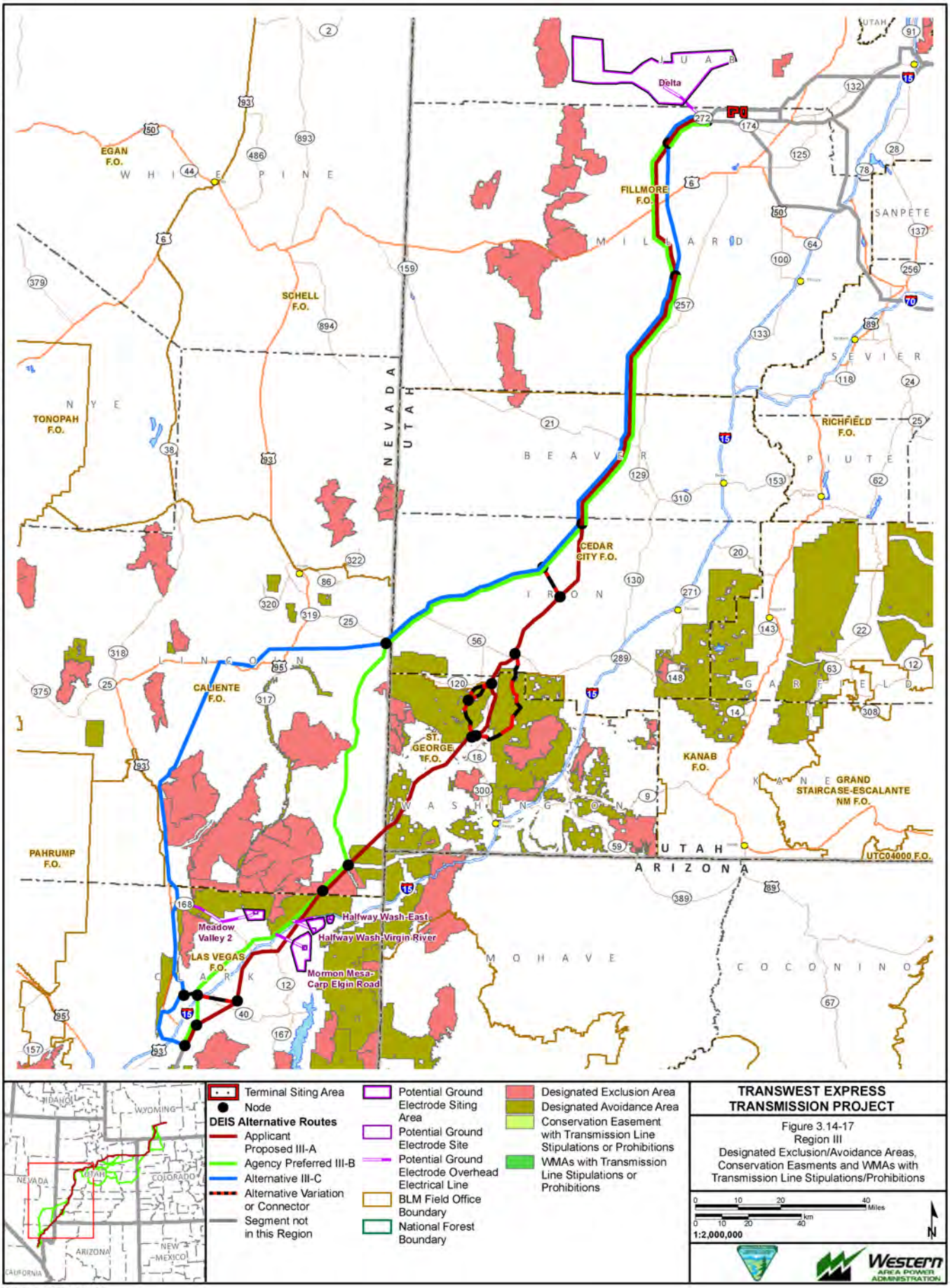
Regulating Agency	Plan, Policy, or Regulation	Allowed Uses in Agency Designated Land Management Districts Crossed by Proposed Project
Millard County, Utah	Millard County General Plan Millard County Zoning Ordinance Millard County Major Utility Corridor Map (2009a)	Land Use- spatial data not available Future Land Use – spatial data not available Zoning - Range & Forest, Agricultural districts: transmission lines 140 kV or larger authorized by a Conditional Use permit within designated and mapped major utility corridor.
Washington County, Utah	Washington County General Plan Washington County Zoning Code	Land Use- spatial data not available Future Land Use – Open Space Multiple Use, Open Space Conservation, Agricultural to Residential Transition Zoning - Open Space Conservation, Open Space, Agricultural districts: Public utilities and transmission lines are a conditional use of Open Space districts; not specified for Agricultural districts.
Clark County, Nevada	Clark County Comprehensive Plan Clark County Multiple Species Habitat Conservation Plan	Land Use- Public, Woodland Recreation Future Land Use – Public, Woodland Recreation Zoning - Rural Open Land, Open Space, Industrial districts: to acquire ROW for transmission lines, the proposed route shall be submitted to the board of county commissioners for review and recommendation.
Lincoln County, Nevada	Lincoln County Master Plan Lincoln County Public Land Plan (1996) Southeast Lincoln County Habitat Conservation Plan	Land Use- Public, Woodland Recreation Future Land Use – Public, Woodland Recreation Zoning – Almost all of reference lines on public land. All other districts: to acquire ROW for transmission lines, the proposed route shall be submitted to the board of county commissioners for review and recommendation.

Avoidance and exclusion areas occur within the ROWs and corridors under Alternative III-C only. **Table 3.14-21** summarizes the avoidance areas and exclusion areas by Alternative. **Figure 3.14-17** identifies all Region III avoidance areas and exclusion areas.

Table 3.14-21 Region III Avoidance and Exclusion Areas by Alternative

Avoidance/Exclusion	Alternative III-A	Alternative III-B	Alternative III-C
Avoidance	No Avoidance Areas Under This Alternative	No Avoidance Areas Under This Alternative	Coyote Springs Valley ACEC
Reference Line Crossing of Avoidance (miles)[1]	0	0	1
Exclusion	No Exclusion Areas Under This Alternative	No Exclusion Areas Under This Alternative	Kane Springs ACEC
Reference Line Crossing of Exclusion (miles)[1]	0	0	9

[1] Avoidance/exclusion area is within corridor but not crossed by reference line if number of miles is 0.



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Alternative III-A (Applicant Proposed)

Approximately 81 percent of the 276-mile Alternative III-A route would be located on BLM or USFS-managed lands; an additional 5 percent would be located on state lands. Approximately 62 percent of the route would be within a BLM or WWEC-designated utility corridor (68 miles and 153 miles, respectively) and 203 miles would be co-located with other ROWs. The remainder of the route mileage is not located within a designated corridor. No avoidance or exclusion areas would be crossed under the Alternative III-A route.

The ROW for this alternative overlaps with 8 acres of the Toquop disposal lands in the Caliente FO. This may affect the ability of this area to be utilized for agricultural production in the future; however, the reference line does not cross through the disposal lands so it may be possible to keep all project components out of the area. Mitigation Measure **LU-1** provides for coordination with land managers regarding the placement of project components. If it is not possible to locate project components outside of the Toquop disposal lands this alternative may affect the ability to designate this area for other uses.

Under Alternative III-A, approximately 38 miles (14 percent) would be located on private land. No agricultural cropland or center pivots would be affected by the 250-foot-wide transmission line ROW; there would be 12 center pivots located with the 2-mile transmission line corridor.

An estimated 3,552 acres (178 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 970 acres (49 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

There would be 7 residences, 7 commercial/industrial structures, 1 agricultural structure, and 10 outbuildings within 500 feet of the proposed reference line. There would be 2 communities (Central, Utah and Jackman, Nevada) and 1 national historic landmark within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible designated land uses within the community.

Under Alternative III-A, approximately 16 miles of the 250-foot-wide transmission line ROW would be located on NFS lands within the Dixie National Forest. The reference line, the 250-foot-wide transmission line ROW, and the 2-mile transmission line corridor would pass through approximately 7 miles of areas managed for livestock grazing, 5 miles of areas managed for big game winter range, 2 miles of areas managed for Roaded Natural Recreation, and 3 miles in areas with only general forest management direction. **Appendix C**, Section C.4 contains the relevant Standard and Guidelines for each of the management areas. Development of a transmission line generally would be compatible with the management prescriptions for these areas; however, construction timing restrictions would apply within big game winter range management areas for protection of wildlife resources, and temporary roads would be need to reclaimed within one season after intended use.

Additional portions of the 2-mile transmission line corridor also would encompass acreage managed for wildlife habitat. Development of access roads and support facilities within these areas generally would be compatible with the management goals (see **Appendix C**, Section C.4).

Alternative III-B (Agency Preferred)

Approximately 75 percent of the 285-mile Alternative III-B route would be located on BLM-managed lands; an additional 3 percent would be located on state lands and 5 percent would be on tribal lands (the Moapa

Reservation). Alternative III-B contains 65 miles in BLM-designated corridors and 77 miles in the WWEC corridor. A total of 145 miles would be co-located with other ROWs. No avoidance or exclusion areas would be crossed under this alternative. The crossing of the Moapa Reservation would be within a utility corridor administered by the BLM; therefore, no additional BIA approval would be required if the alternative route remains within the designated BLM-administered utility corridor through the Moapa Indian Reservation. The use of portions of the 2-mile transmission line corridor areas would have to be negotiated between the Proponents and the Moapa Tribe. The Tribe has the authority to negotiate the location, management, and compensation for the transmission line through the Reservation and also could choose to deny the application to cross their Reservation. The outcome of this negotiation is beyond the scope of this EIS.

This alternative would cross the Yucca Mountain rail line land withdrawal area. Surface entry and mining claims are precluded (DOE 2005); however, ROWs are not precluded through this area therefore neither the Caliente FO nor the Nevada State Office view this as incompatible with the intended land use. The ROW also overlaps with 62 acres of the Crestline disposal lands and 8 acres of the Toquop disposal lands in the Caliente FO. Mitigation Measure **LU-1** provides for coordination with land managers regarding the placement of project components. It may be possible to keep project components out of the Toquop disposal lands but it is unlikely that the same would be true for the Crestline disposal lands because the reference line passes through those lands. This alternative may affect the ability of the area to be designated for other uses.

Under Alternative III-B, approximately 48 miles (17 percent) would be located on private land. Alternative III-B would require 14 acres of additional ROW clearing, 9 acres of construction disturbance, and 2 acres of permanent removal of croplands. No center pivots would be located along the project reference line; there would be four center pivots located within the 2-mile transmission line corridor.

An estimated 3,211 acres (161 AUMs) would be removed from grazing allotments due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 791 acres (40 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

There would be 2 residences, and 6 commercial/ industrial structures within 500 feet of reference line. There would be 8 communities, 1 park, and 1 school within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible designated land uses within the communities.

Alternative III-C

Approximately 77 percent of the 308-mile Alternative III-C route would be located on BLM-managed lands; an additional 3 percent would be located on state lands. Alternative III-C would have 41 miles in BLM-designated utility corridors and 45 miles in the WWEC corridor. A total of 213 miles would be co-located with other ROWs. Approximately 1 mile of an avoidance area (Coyote Springs Valley ACEC) and 9 miles of an exclusion area (Kane Springs ACEC) would be crossed by the transmission reference line.

This alternative would cross the Yucca Mountain rail line land withdrawal area. Surface entry and mining claims are precluded (DOE 2005); however, ROWs are not precluded through this area therefore neither the Caliente FO nor the Nevada State Office view this as incompatible with the intended land use. The ROW also overlaps with 205 acres of the Caliente disposal lands in the Caliente FO. This may affect the ability of this area to be utilized for agricultural production in the future. Mitigation Measure **LU-1** provides for coordination with land managers regarding the placement of project components; however, it is unlikely that

all project components would be located outside of these disposal lands because the reference line passes through those lands. This alternative may affect the ability of the area to be designated for other uses.

Approximately 61 miles (20 percent) would be located on private land. Alternative III-C would require 4 acres of additional ROW clearing, 4 acres of construction disturbance, and no permanent removal of croplands. No center pivots would be located along the project reference line; there would be four center pivots located within the 2-mile transmission line corridor.

An estimated 3,533 acres (177 AUMs) would be removed from grazing allotment due to surface disturbance associated with construction activities. Once construction is complete, areas not required for operations would be reclaimed. As described in Section 3.5.6.2, reclamation of herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and livestock. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term and may not be successful. For more detail on reclamation, see Section 3.5.6.2. Over the life of the project, 866 acres (43 AUMs) would be lost from livestock grazing. This acreage comprises less than 1 percent of total AUMs available on these allotments.

No center pivots would be crossed by the 250-foot-wide transmission line ROW. There would be 2 residences and 7 commercial/industrial structures within 500 feet of the reference line.

There would be nine communities within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible designated land uses within the communities.

Alternative Variations in Region III

The land ownership crossed by the alternative variations and other key impact parameters are summarized in **Table 3.14-22**.

Alternative Connector in Region III

The Moapa Alternative Connector comprises 13 miles located on lands managed by the BLM in the Las Vegas FO. Two miles are located within designated utility corridors: 2 miles in a BLM-designated corridor and 0.25 mile in the WWEC corridor. A total of 3 miles are co-located with other ROWs. The connector corridor does not include any avoidance/exclusion areas. No crop production is within the Project corridor. There are no structures within 500 feet of the reference line. There are no communities within the 2-mile transmission line. An estimated 161 acres (8 AUMs) would be removed from grazing allotments from construction impacts and 33 acres (2 AUMs) due to operational impacts.

The Avon Alternative Connector is located in the Cedar City FO and comprises 4 miles located on lands managed by the BLM; 3 miles on private lands and less than 1 mile on state lands. It is not located within designated utility corridors and it is not co-located with any other ROWs. The connector corridor does not include any avoidance/exclusion areas. No crop production is within the Project corridor. An estimated 103 acres (5 AUMs) would be removed from grazing allotments due to construction impacts and 21 acres (1 AUM) due to operational impacts. There are no structures within 500 feet of the reference line. There is one community (Avon, Utah) within the 2-mile transmission line corridor. There are no identified incompatible designated land uses within the community.

Table 3.14-22 Impact Parameters of Alternative Variations and Comparative Portions of Alternatives in Region III

Impact Parameter	Description	Ox Valley East Alternative Variation	Comparable (Portions of Alternative III-A)	Ox Valley West Alternative Variation	Comparable (Portions of Alternative III-A)	Pinto Alternative Variation	Comparable (Portions of Alternative III-A)
Jurisdiction	BLM (miles)	0	--	1	--	7	3
	Cedar City	0	0	<1	0	4	3
	St. George	0	0	0	0	3	0
	Private (miles)	<1	3	<1	3	1	6
	USFS (miles)	16	12	15	12	21	14
	State	0	0	0	0	0	1
	Total (miles)	**16**	**15**	**17**	**15**	**29**	**24**
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative)[2]	2/8%	14/88%	2/13%	14/93%	2/7%	15/63%
	Length within WWEC designated corridors (miles/percent of alternative)[3]	<1/5%	12/80%	<1/5%	12/80%	1/3%	14/58%
	Total (miles/percent of alternative)	2/8%	14/88%	2/13%	14/93%	2/7%	16/66%
Co-location	Greenfield /Co-located mileage	16/0	0/15	16/0	0/15	29/0	0/24
Avoidance/Exclusion Areas Crossed	Avoidance (miles)	6	0	6	0	20	0
	Exclusion (miles)	0	0	0	0	0	0
	Description	Dixie National Forest	N/A	Dixie National Forest	N/A	Dixie National Forest	N/A
Dixie National Forest miles-acres 250-foot ROW / acres 2-mile corridor	General Management Area	7 – 206/10,173	3 -102/6,598	6 - 178/7,167	3 -102/6,598	6 – 182/10,699	3 – 102/9,556
	2B Roaded Natural Recreation	<1 – 11/618	2 – 57/1,458	1 – 23/446	2 -57/1,458	1 – 32/1,661	2 – 57 /1,458
	4C Wildlife Habitat - Brushy Range	0	0/1,613	0	0/1,613	5 – 158/4,796	0/1,613
	5A Big-Game Winter Range	3 – 82/2,057	2 -75/1,637	3 – 82/2,057	2 -75/1,637	1 – 28/795	1 – 44/736
	6A Livestock Grazing	5 – 158/2,703	6 – 187/5,262	6 – 174/1,598	6 – 187/5,262	7 – 213/7,032	7 – 223/5,958
	9A Riparian Management	0	0	0	0	1 – 14/227	0
	10B Municipal Water Supply Watersheds	<1 -13/944	0	<1 – 13/944	0	0/77	0
Agricultural Lands	Additional ROW clearing and vegetation disturbance (acres)	0	0	0	0	0	0
	Construction disturbance (acres)	0	0	0	0	1	0
	Operation disturbance (acres)	0	0	0	0	<1	0

Table 3.14-22 Impact Parameters of Alternative Variations and Comparative Portions of Alternatives in Region III

Impact Parameter	Description	Ox Valley East Alternative Variation	Comparable (Portions of Alternative III-A)	Ox Valley West Alternative Variation	Comparable (Portions of Alternative III-A)	Pinto Alternative Variation	Comparable (Portions of Alternative III-A)
Livestock Grazing	Construction disturbance (acres)	276	247	263	247	427	328
	Estimated decreased AUMs (AUMs/percent of total AUMs)[4]	14/<1%	12/<1%	13/<1%	12/<1%	21/<1%	16/<1%
	Operation disturbance (acres)	100	94	99	94	105	112
	Long-term decreased AUMs (AUMs)[4]	5/<1%	5/<1%	5/<1%	5/<1%	5/<1%	6/<1%
Structures within 500 feet of reference line	Residential (count)	1	0	1	0	0	0
	Commercial/Industrial (count)	0	0	0	0	0	0
	Agricultural (count)	0	0	0	0	0	0
	Outbuilding (count)	1	0	0	0	0	0
	Total (count)	**2**	**0**	**1**	**0**	**0**	**0**
Structures within 200 feet of reference line	Residential (count)	0	0	0	0	0	0
	Commercial/Industrial (count)	0	0	0	0	0	0
	Agricultural (count)	0	0	0	0	0	0
	Outbuilding (count)	1	0	0	0	0	0
	Total (count)	**1**	**0**	**0**	**0**	**0**	**0**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

[4] The AUM decrease was calculated based on an average number of AUMs per acre for the grazing allotment acreage lost.

Note: Discrepancies in totals due to rounding.

Alternative Ground Electrode Systems in Region III

A ground electrode system of approximately 600 acres in size would be necessary in Region III within 50 to 100 miles of the southern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The ground electrode system alternative locations in Region III are depicted in Chapter 2.0 on **Figure 2-14**. The conceptual locations are located on BLM lands that are not within SDAs, croplands, or private lands containing residences or other built-environment uses. Initial and permanent disturbances to grazing from the proposed action alternatives from the construction and operation of ground electrode systems in conceptual areas in Region III would be as described above in Section 3.14.6.2 Impacts Common to All Alternative Routes and Associated Facilities.

Region III Conclusion

Alternatives III-A, III-B, and III-C have similar impacts to most of the parameters discussed. Alternative III-A would utilize the greatest amount of designated corridors (170 miles and 62 percent of the route), whereas Alternative III-B would utilize 127 miles (45 percent of the route), and Alternative III-C would utilize the fewest (80 miles and 26 percent of the route). Alternative III-C has the greatest amount of co-located mileage (213) and Alternative III-B has the fewest (145). Alternative III-B would create the greatest disturbance to agricultural lands and Alternative III-A would create the fewest. No avoidance or exclusion areas would be crossed by Alternatives III-A or III-B; however, Alternative III-C would cross 1 mile of the Coyote Springs Valley ACEC Avoidance Area and 9 miles of the Kane Springs ACEC Exclusion Area. Livestock grazing impacts would be fairly similar between the applicant preferred route and the agency preferred alternative in Region III.

The alternative variations in Region III include the Ox Valley East, Ox Valley West, and Pinto variations. No portions of these variations are co-located and they all cross through avoidance areas in the Dixie National Forest (6 miles for the Ox Valley East and West variations and 20 miles for the Pinto Variation).

The alternative connectors in Region III include the Moapa and Avon connectors. Two miles of the Moapa Connector are located within designated corridors and 3 miles are co-located with other ROWs. No miles of the Avon Connector are located within designated corridors or co-located.

3.14.6.6 Region IV

Land ownership crossed by the alternatives in Region IV includes BLM, DOE, Bureau of Reclamation, NPS, and private. BLM lands are within the Las Vegas FO; NPS lands consist of the Lake Mead National Recreation Area; and private lands include the Boulder City annexation area, described under the Southern Terminal Impacts in Section 3.14.7.1, Impacts from Terminal Construction, Operation, and Decommissioning and shown on **Figures 3.14-5** and **3.14-6**. The Bureau of Reclamation and DOE lands also are crossed. **Table 3.14-23** summarizes land ownership and other impact parameters for each alternative in Region IV. The proportion of proposed IV-A, IV-B, and IV-C alternatives within designated utility ROWs and corridors is relatively low; however, as shown on **Figure 3.14-5**, the alternative routes are generally located within other existing linear corridors, and along linear roadways. Based on a GIS analysis of land cover types and a review of recent aerial photography of the project corridors, there are no producing croplands within the project corridors or ROWs under any alternative within Region IV. Grazing allotments are designated on BLM lands contained within project corridors in Region IV; however, a review of BLM allotment management summaries indicate there are currently no permitted grazing activities on BLM grazing allotments. Most of the structures affected by Alternative IV-A are located in the city of Henderson, Nevada.

Table 3.14-23 Region IV Alternative Route Land Use Impact Parameters

Impact Parameter	Description	Alternative IV-A	Alternative IV-B	Alternative IV-C
Jurisdiction	BLM (Las Vegas FO) (miles/percent of alternative)	25/68%	8/21%	8/18%
	Private (miles/percent of alternative)	6/16%	16/41%	19/45%
	Bureau of Reclamation (miles/percent of alternative)	6/16%	0	0
	DOE (miles/percent of alternative)	0	1/2%	2/5%
	NPS (miles/percent of alternative)	0	14/36%	14/32%
	Total (miles)	**37**	**39**	**44**
Nevada	Clark County	37	39	44
Designated Utility Corridors[1]	Utility Corridors designated in BLM RMPs[2] (miles/percent of alternative)	6/16%	5/13%	5/11%
	West-wide Energy Corridor[3] (miles/percent of alternative)	15/41%	6/15%	6/13%
	Total (miles/percent of alternative)	15/41%	6/15%	6/13%
Co-location	Greenfield/Co-located mileage	0/37	12/27	12/33
Livestock Grazing	Currently no permitted grazing activities on BLM grazing allotments along this alternative.			
Communities	Count within 2-mile transmission line corridor	2	1	1
Structures within 500 feet of reference line	Residential (count)	11	9	9
	Commercial/Industrial (count)	3	3	3
	Agricultural (count)	0	0	0
	Outbuilding (count)	0	9	9
	Total (count)	**14**	**12**	**12**
Structures within 200 feet of reference line	Residential (count)	0	0	0
	Commercial/Industrial (count)	2	0	0
	Agricultural (count)	0	0	0
	Outbuilding (count)	0	0	0
	Total (count)	**2**	**0**	**0**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

Note: Discrepancies in totals due to rounding.

Alternatives IV-A, IV-B, and IV-C cross through the counties and local and federal entities listed in **Table 3.14-24**. The development of transmission lines is not addressed in all zoning ordinances. These governmental units would require a consultation with their planning agency to determine the procedure for permitting the Proposed Project.

Table 3.14-24 Consistency in Region IV with Applicable Land Use Plans and Policies

Regulating Agency	Plan, Policy, or Regulation	Proposed Project in Agency Designated Land Management Districts
Clark County, Nevada	Clark County Comprehensive Plan Title 30 Development Code Clark County Multiple Species Habitat Conservation Plan	Land Use- Public, Woodland Recreation Future Land Use – Public, Woodland Recreation Zoning - Rural Open Land, Open Space, Industrial districts: to acquire ROW for transmission lines, the proposed route shall be submitted to the board of county commissioners for review and recommendation.

Table 3.14-24 Consistency in Region IV with Applicable Land Use Plans and Policies

Regulating Agency	Plan, Policy, or Regulation	Proposed Project in Agency Designated Land Management Districts
City of Henderson, Nevada	City of Henderson Comprehensive Plan City of Henderson College Area Plan Henderson Municipal Code	Land Use – no available spatial data Future Land Use – Low Density Residential, Public/Semi-Public, High Density Residential, Highway Commercial Zoning – Residential (RH-24, RS-1A, DH): major utilities are a conditional use.
Boulder City, Nevada	Boulder City Conservation Easement Agreement and Boulder City Master Plan	Land Use (city)- Open Lands, Parks and Recreation, Land Use (Eldorado Valley) - Energy, Preserve Land Use (city)- Open Lands, Parks and Recreation, Land Use (Eldorado Valley) - Energy, Preserve, Open Lands Zoning - Alternatives IV-B and IV-C are partially outside of existing utility ROWs, and crossing through multiple zoning districts. The alternatives shall be submitted to the board of county commissioners for review and recommendation.
National Park Service	Lake Mead National Recreation Area General Management Plan & Alternatives, 1986	No approved utility corridors in Proposed Project corridors. The proposed route crosses area designated Environmental Protection Subzone. Proposed project is not consistent with General Management Plan (NPS 2011). Per the General Management Plan, the NPS generally would oppose granting any further corridors (NPS 1986).

Avoidance and exclusion areas occur within the ROWs and Project corridors under all alternatives. **Table 3.14-25** summarizes the SDAs that also are avoidance areas and exclusion areas within Project corridors. **Figure 3.14-18** identifies Region IV designated avoidance and exclusion areas.

Table 3.14-25 Avoidance and Exclusion Areas in Region IV Corridors

Avoidance/Exclusion	Alternative IV-A	Alternative IV-B	Alternative IV-C
Avoidance	Rainbow Gardens ACEC River Mountains ACEC	Rainbow Gardens ACEC	Rainbow Gardens ACEC
Reference Line Crossing of Avoidance Areas (miles)	11	2	2
Exclusion	Sunrise Mountain ISA	None	None
Reference Line Crossing of Exclusion Areas (miles)	1	0	0

Alternative IV-A (Applicant Proposed and Agency Preferred)

Over 80 percent of the 37-mile Alternative IV-A route would be located on federally managed lands. Unlike the other alternatives in Region IV, Alternative IV-A would cross through Bureau of Reclamation land. Six miles, equaling 16 percent of the route, would be crossed. Approximately 15 miles (41 percent) of the Alternative IV-A route is within a designated utility corridor; 6 miles of BLM-designated corridors and 15 miles of designated WWEC corridor. The entire alternative route would be co-located with other ROWs. Designated avoidance areas in the Rainbow Gardens and River Mountains ACEC would be crossed by the reference line for 11 miles. An exclusion area in the Sunrise Mountain ISA would be crossed for 1 mile.

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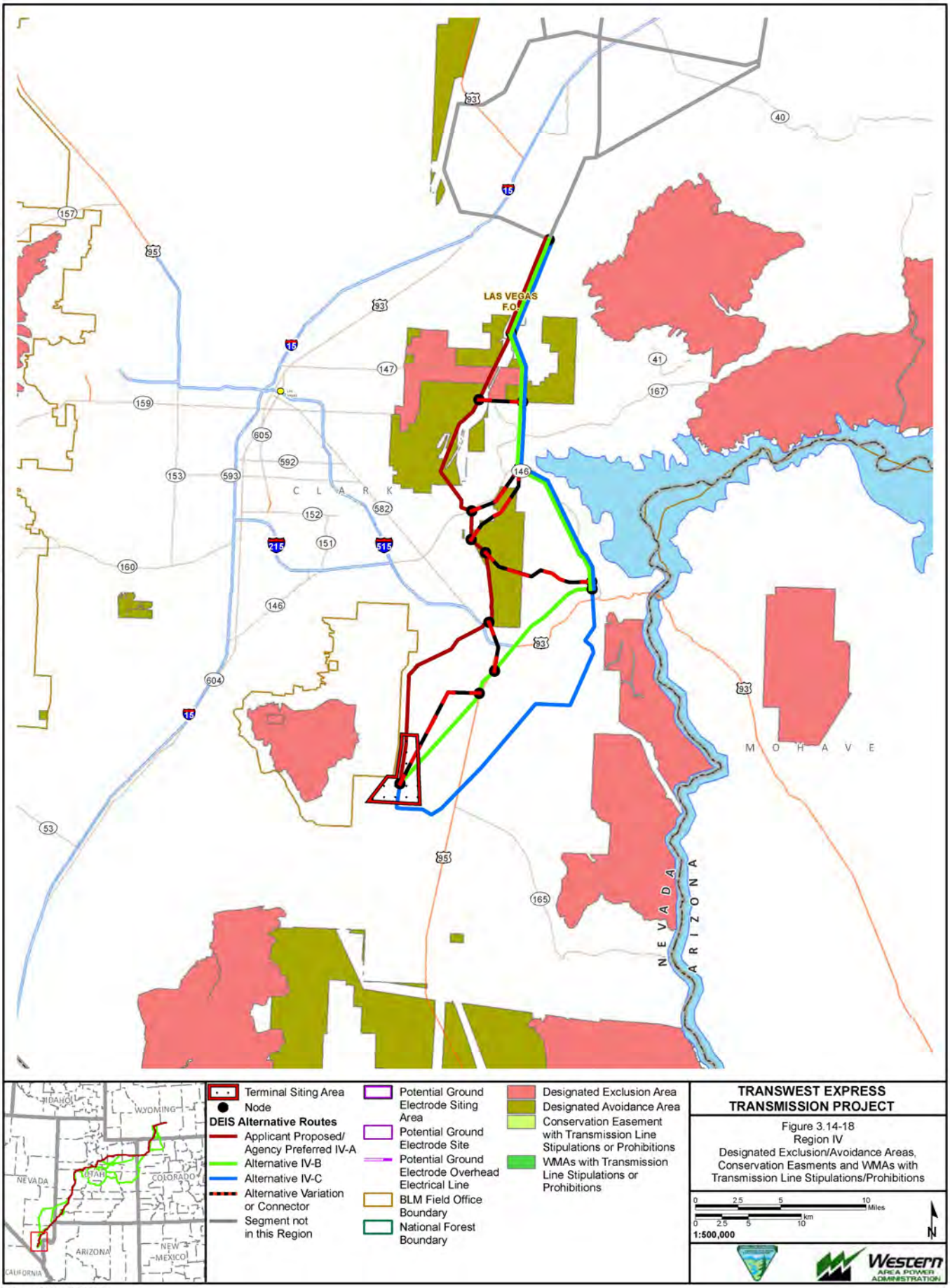


TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.14-18
Region IV
Designated Exclusion/Avoidance Areas, Conservation Easments and WMAs with Transmission Line Stipulations/Prohibitions

Exported On: 4/23/2013

Under Alternative IV-A, approximately 8 miles (19 percent) would be located on private land. There would be 11 residential structures and 3 commercial/industrial structures within 500 feet of the proposed reference line. There would be two communities (Henderson and Boulder City) within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible designated land uses within the communities.

Alternative IV-B

Approximately 59 percent of the 39-mile Alternative IV- route would be located on federally managed lands. Alternative IV-B contains 5 miles in BLM-designated utility corridors and 6 miles in the WWEC corridor (a total of 15 percent). A total of 27 miles would be co-located with other ROWs. Designated avoidance areas would be crossed by the reference line for 2 miles in the Rainbow Gardens ACEC, and no exclusion areas would be crossed. General Management Plan for the Lake Mead NRA, while not specifically identifying the Alternative IV-B route area as a designated ROW avoidance area, indicates that the NPS generally would oppose granting any further corridors; instead, additional use of existing corridors would be favored in the event there is a justified need for additional utility lines through the NRA (NPS 1986). The proposed route is not within a designated corridor, and the NPS has indicated that the proposed development is not consistent with the NRA's General Management Plan (NPS 2011).

Under Alternative IV-B, approximately 16 miles (41 percent) would be located on private land. There would be 9 residential structures and 3 commercial/industrial structures within 500 feet of reference line. There would be one community (Boulder City) within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible designated land uses within the community.

Alternative IV-C

Approximately 55 percent of the 44-mile Alternative IV-C route would be located on federally managed lands with 5 miles in BLM-designated utility corridors and 6 miles in the WWEC corridor (a total of 13 percent). A total of 33 miles would be co-located with other ROWs. Designated avoidance areas would be crossed by the reference line for 2 miles in the Rainbow Gardens ACEC, and no exclusion areas would be crossed. As discussed under Alternative IV-B, the NPS has indicated that the proposed development is not consistent with the NRA's General Management Plan (NPS 2011).

Under Alternative IV-C, approximately 19 miles (45 percent) would be located on private land. There would be 9 residential structures and 3 commercial/industrial structure within 500 feet of the proposed reference line. There would be one community (Boulder City) within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible designated land uses within the community.

Alternative Variation in Region IV

The land ownership crossed by the alternative variation and other key impact parameters are summarized in **Table 3.14-26**. No cropland, grazing areas, or structures would be within either of the Project corridors. There would be one community (Boulder City) within the 2-mile transmission line corridor (see Section 3.18, Public Health and Safety). There are no identified incompatible designated land uses within the community.

Alternative Connectors in Region IV

The land ownership crossed by the alternative connectors and other key impact parameters are summarized in **Table 3.14-27**. None of the connectors fall within designated utility corridors. No cropland would be within the Project corridors. Every proposed connector would cross an avoidance area except for the Railroad Pass Connector. The Sunrise Mountain Connector would cross 1 mile of an exclusion area in the Sunrise Mountain ISA.

Table 3.14-26 Impact Parameters of Marketplace Alternative Variation and Comparative Portions of Alternative IV-B in Region IV

		Marketplace Alternative Variation	Comparable (portion of Alternative IV-B)
Jurisdiction	BLM (Las Vegas FO) (miles)	3	0
	Private (miles)	5	7
	DOE (miles)	1	<1
	NPS (miles)	0	0
	Total (miles)	**8**	**7**
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative)[2]	<1/2%	0/0%
	Length within WWEC designated corridors (miles/percent of alternative)[3]	<1/2%	0/0%
	Total (miles/percent of alternative)	**<1/2%**	**0/0%**
Co-location	Greenfield/Co-located mileage	5/3	0/7
Avoidance/ exclusion		0	0
Livestock Grazing	Currently no permitted grazing activities on BLM grazing allotments along this alternative.		
Communities	Count within 2-mile transmission line corridor	1	1
Structures within 500 feet of reference line	Residential (count)	0	0
	Commercial/Industrial (count)	0	1
	Agricultural (count)	0	0
	Outbuilding (count)	0	0
	Total	**0**	**1**
Structures within 200 feet of reference line	Residential (count)	0	0
	Commercial/Industrial (count)	0	0
	Agricultural (count)	0	0
	Outbuilding (count)	0	0
	Total	**0**	**0**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

Note: Discrepancies in totals due to rounding.

Table 3.14-27 Impact Parameters of Alternative Connectors in Region IV

Impact Parameter	Description	Sunrise Mountain Alternative Connector	Lake Las Vegas Alternative Connector	Three Kids Mine Alternative Connector	River Mountain Alternative Connector	Railroad Pass Alternative Connector
Jurisdiction	BLM (Las Vegas FO) (miles)	3	0	1	2	0
	Private (miles)	0	1	1	0	3
	Bureau of Reclamation (miles)	0	2	3	1	<1
	NPS (miles)	0	1	1	4	0
	Total (miles)	**3**	**4**	**5**	**7**	**3**
Designated Utility Corridors[1]	Length within RMP designated corridors (miles/percent of alternative)[2]	0	0	0	0	0
	Length within WWEC designated corridors (miles/percent of alternative)[3]	1	0	0	0	<1
	Total (miles/percent of alternative)	**1/33%**	**0**	**0**	**0**	**0**
Co-location	Greenfield /Co-located mileage	3/0	0/4	0/5	0/7	0/3
Avoidance/Exclusion Areas Crossed	Avoidance (miles)	2	1	3	3	0
	Exclusion (miles)	1	0	0	0	0
	Description	Rainbow Gardens ACEC and Sunrise Mountain ISA	River Mountains ACEC	River Mountains ACEC	River Mountains ACEC	N/A
Livestock Grazing	Currently no permitted grazing activities on BLM grazing allotments along this alternative.					
Communities	Count within 2-mile transmission line corridor	0	1	1	1	2
Structures within 500 feet of reference line	Residential (count)	0	0	0	0	0
	Commercial/Industrial (count)	0	1	0	1	0
	Agricultural (count)	0	0	0	0	0
	Outbuilding (count)	0	1	0	0	0
	Total	**0**	**2**	**0**	**1**	**0**
Structures within 200 feet of reference line	Residential (count)	0	0	0	0	0
	Commercial/Industrial (count)	0	1	0	1	0
	Agricultural (count)	0	0	0	0	0
	Outbuilding (count)	0	1	0	0	0
	Total	**0**	**2**	**0**	**1**	**0**

[1] Designated utility and West-wide Energy Corridors may be co-located, or overlap in some locations.

[2] Corridors identified by the BLM and the USFS in their respective land management plans.

[3] Designated by the DOE in November 2008 pursuant to Section 368 of the Energy Policy Act of 2005.

Note: Discrepancies in totals due to rounding.

Region IV Conclusion

Alternatives IV-A, IV-B, and IV-C have similar impacts to most of the parameters discussed. Alternative IV-A would utilize the greatest amount of designated corridors (15 miles and 41 percent of the route), whereas Alternatives IV-B and IV-C utilize approximately 6 miles (15 percent and 13 percent, respectively) of their routes. Alternative IV-A is co-located with existing ROWs for its entire length (37 miles). Alternatives IV-B and IV-C are approximately 60 percent co-located and 40 percent Greenfield. Alternatives IV-B and IV-C cross 2 miles of an avoidance area in the Rainbow Gardens ACEC. Alternative IV-A crosses 11 miles of avoidance areas in the Rainbow Gardens and River Mountain ACECs (6 miles and 5 miles, respectively), and 1 mile of exclusion area in the Sunrise Mountain ISA. Currently, there are no permitted grazing activities on BLM grazing allotments in Region IV; therefore, there would be no impacts to livestock grazing in Region IV for any alternative.

The Marketplace Alternative Variation would be the only Alternative Variation in Region IV. Approximately 2 percent of the 8-mile route would be located within a designated corridor. Three miles of the route would be co-located with existing ROWs and 5 miles would be Greenfield. No avoidance or exclusion areas would be crossed by the Marketplace Variation.

The Alternative Connectors in Region IV include the Sunrise Mountain, Lake Las Vegas, Three Kids Mine, River Mountain, and Railroad Pass Connectors. One mile (33 percent) of the Sunrise Mountain Alternative Connector would be located in a designated utility corridor; however, no utilities currently exist within this corridor. None of the other alternative connectors would utilize designated corridors but they are entirely co-located with existing utilities. The Railroad Pass Connector is the only one that would not cross through avoidance or exclusion areas. The Sunrise Mountain Connector crosses through the Rainbow Gardens ACEC and the Sunrise Mountain ISA. The Lake Las Vegas, Three Kids Mine, and River Mountain Connectors all cross through the River Mountains ACEC; however, the Lake Las Vegas has the shortest crossing distance of the three.

3.14.6.7 Residual Effects

Land use mitigation measures would reduce impacts through structure siting. If applied, there would be no residual effects. If this measure cannot be applied, residual impacts would consist of land use that would be inconsistent with planned goals and uses.

Agriculture mitigation measures would reduce impacts through structure placement and construction scheduling. Residual impacts would comprise a loss of some agricultural lands as identified above and some restrictions in future placement of center pivots.

Range-related mitigation measures would reduce impacts through structure placement and construction scheduling, maintenance of grazing access, and speed limits. Residual impacts would comprise a loss of AUMs, forage, and potential loss of livestock from vehicular travel.

3.14.6.8 Impacts to Land Use Resources from the No Action Alternative

Under the No Action Alternative, there would be no impacts to land use resources as the Proposed Project would not be developed.

3.14.6.9 Irreversible and Irretrievable Commitments of Resources

All operation impacts to land use described above within the 2-mile transmission line corridor would be irretrievable until transmission line decommissioning, after which time all land uses could be reclaimed. However, reclamation activities may have limited success in areas with poor soils, some vegetation communities would take years to reestablish, and some areas may never return to their former vegetation cover and composition. As such, these impacts may represent an irreversible commitment of range resources. Additionally, changes in land use around the proposed transmission line could occur as

a result of its placement and long term operation. These changes are unlikely to be returned to previous use after transmission line decommissioning and should therefore be considered irreversible.

3.14.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

Implementation of the project would result in the conversion some project lands from existing uses to use as ROW corridors. In the short term, the current productivity of lands for agricultural and grazing would be reduced and lands would be unavailable for other uses such as energy production. Long-term impacts to grazing include the disturbance of vegetation covers requiring extended time (10 to 100 years) for recovery, and the potential for weedy annual species such as halogeton and cheatgrass to become established in localized areas for extended periods of time. The project also could result in long term changes to productivity if land use in the area surrounding the project shifts to a more industrial use as a result of the transmission line placement and is lost as an area high visual quality or residential use.

3.15 Special Designation Areas

SDAs are units of land managed by federal or state agencies for the protection and enhancement of specific resource values. SDAs may be Congressionally or agency-designated. Congressionally designated SDAs within the Project analysis area include NWRs, national monuments, WAs, WSAs, WSRs, NCAs, NHTs, and other similar management areas. Agency-designated SDAs include BLM ACECs and USFS IRAs and unroaded/undeveloped areas (URUD). Recreation areas and wildlife management areas identified in this section as designated land use areas are described in more detail in Section 3.13, Recreation Resources. MOAs are described Section 3.16, Transportation.

3.15.1 Data Sources

Information regarding special designations within the analysis area was obtained from a review of existing published sources and agency land use management plans. SDAs (including USFS IRAs) were identified using GIS data from the USFS, the BLM, and the states of Wyoming, Colorado, Utah, and Nevada. Current land use information was obtained from available GIS data, topographic maps, and internet-based tools including GoogleEarth™. A list of the land use plans used in the development of this section is presented in **Tables 1-3** and **1-4**. Vegetation species are presented in a manner consistent with the NRCS Plants Database (NRCS 2010), unless otherwise specified.

3.15.2 Analysis Area

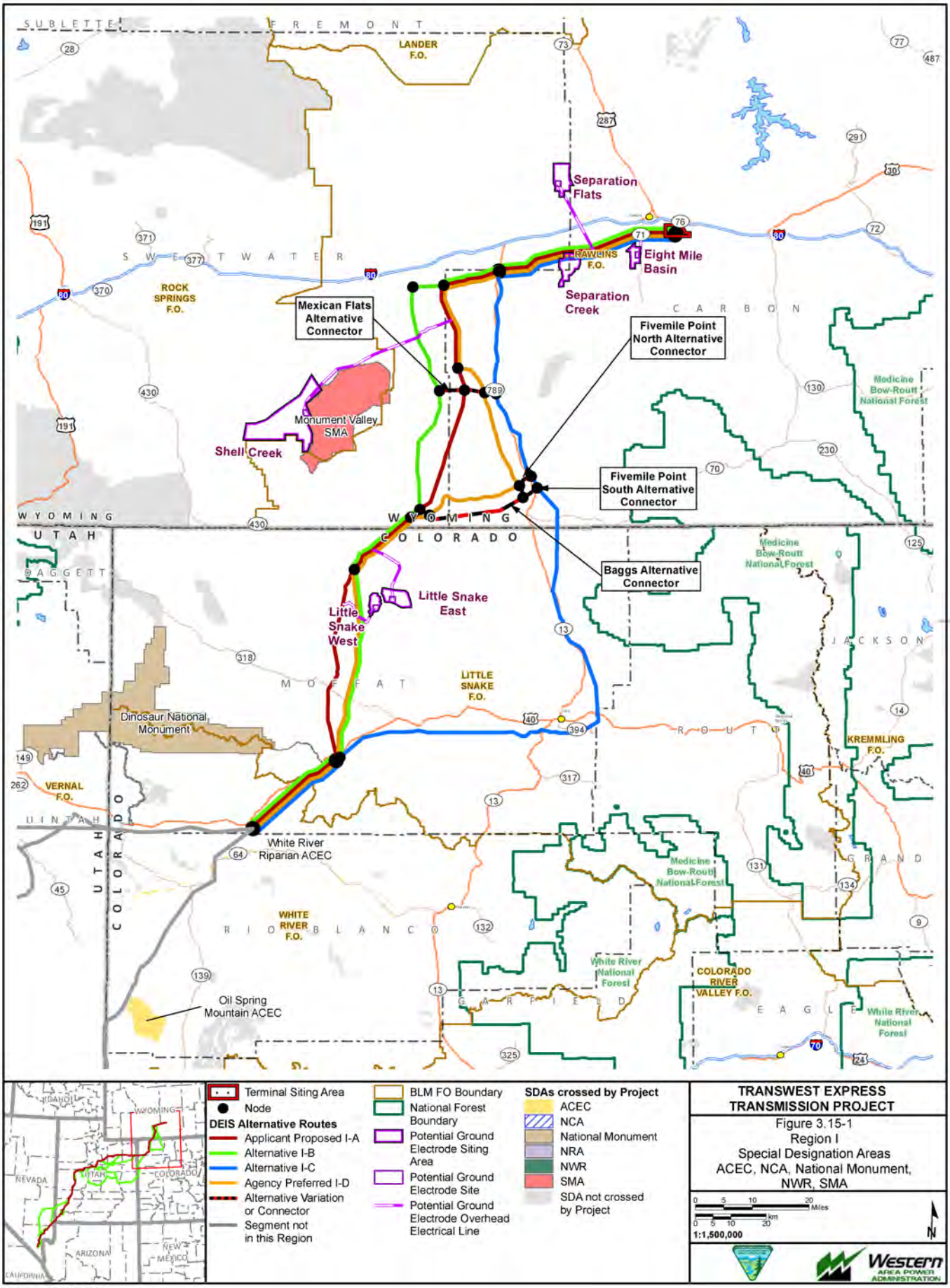
The analysis area for special designations comprises all SDAs with portions of land within the 2-mile transmission line corridors and terminal areas for the various alternatives. The 2-mile transmission line corridor was selected because it encompasses all surface disturbances from construction of the transmission line construction as well as development of access roads and other construction support facilities. In addition, noise and other disturbances from transmission line construction generally would dissipate to background levels well within the 2-mile transmission line corridor. For purposes of clarity, SDAs have been broken out into sets of four maps each; each set containing a separate figure for each region. **Figures 3.15-1** through **3.15-4** depict the NCA, national monument, NRA, NWRs, research natural areas, and ACECs. **Figures 3.15-5** through **3.15-8** identify the wilderness, proposed wilderness, WSA, and WSRs. NHTs, IRAs, and URUD areas are depicted on separate sets if maps and are included with the appropriate discussions in Section 3.15.3. SDAs that are near, but not within, the 2-mile transmission line corridor are depicted on the maps but are shown in grey (i.e., a “special management area” per the map legend) and are unlabeled.

3.15.3 Baseline Description

3.15.3.1 National Wildlife Refuges

The National Wildlife Refuge System, managed by the USFWS, is a national system of public lands and waters set aside to conserve America's fish, wildlife, and plants. The analysis area includes portions of two of the four refuges comprising the Desert NWR complex in Region III (see **Figure 3.15-3**).

- Pahranagat NWR (5,380 acres): Established to provide habitat for migratory birds, especially waterfowl.
- Desert NWR (1.5 million acres): Established for the protection, enhancement, and maintenance of desert bighorn sheep.


SUBLETTE
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LANDER F.O.
Separation Flats
Eight Mile Basin
RAWLINS F.O.
Separation Creek
SWEETWATER
ROCK SPRINGS F.O.
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
CARBON
Medicine Bow-Routt National Forest
Monument Valley SMA
Shell Creek
Fivemile Point South Alternative Connector
WYOMING
UTAH
COLORADO
Baggs Alternative Connector
Little Snake East
Little Snake West
LITTLE SNAKE F.O.
MOFFAT
JACKSON
Dinosaur National Monument
ROUTT
KREMMLING F.O.
VERNAL F.O.
UINTAH
White River Riparian ACEC
GRAND
WHITE RIVER F.O.
RIO BLANCO
White River National Forest
COLORADO RIVER VALLEY F.O.
Oil Spring Mountain ACEC
GARFIELD
EAGLE
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
BLM FO Boundary
National Forest Boundary
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
SDAs crossed by Project
ACEC
NCA
National Monument
NRA
NWR
SMA
SDA not crossed by Project
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.15-1
Region I
Special Designation Areas
ACEC, NCA, National Monument, NWR, SMA
1:1,500,000
Western AREA POWER ADMINISTRATION
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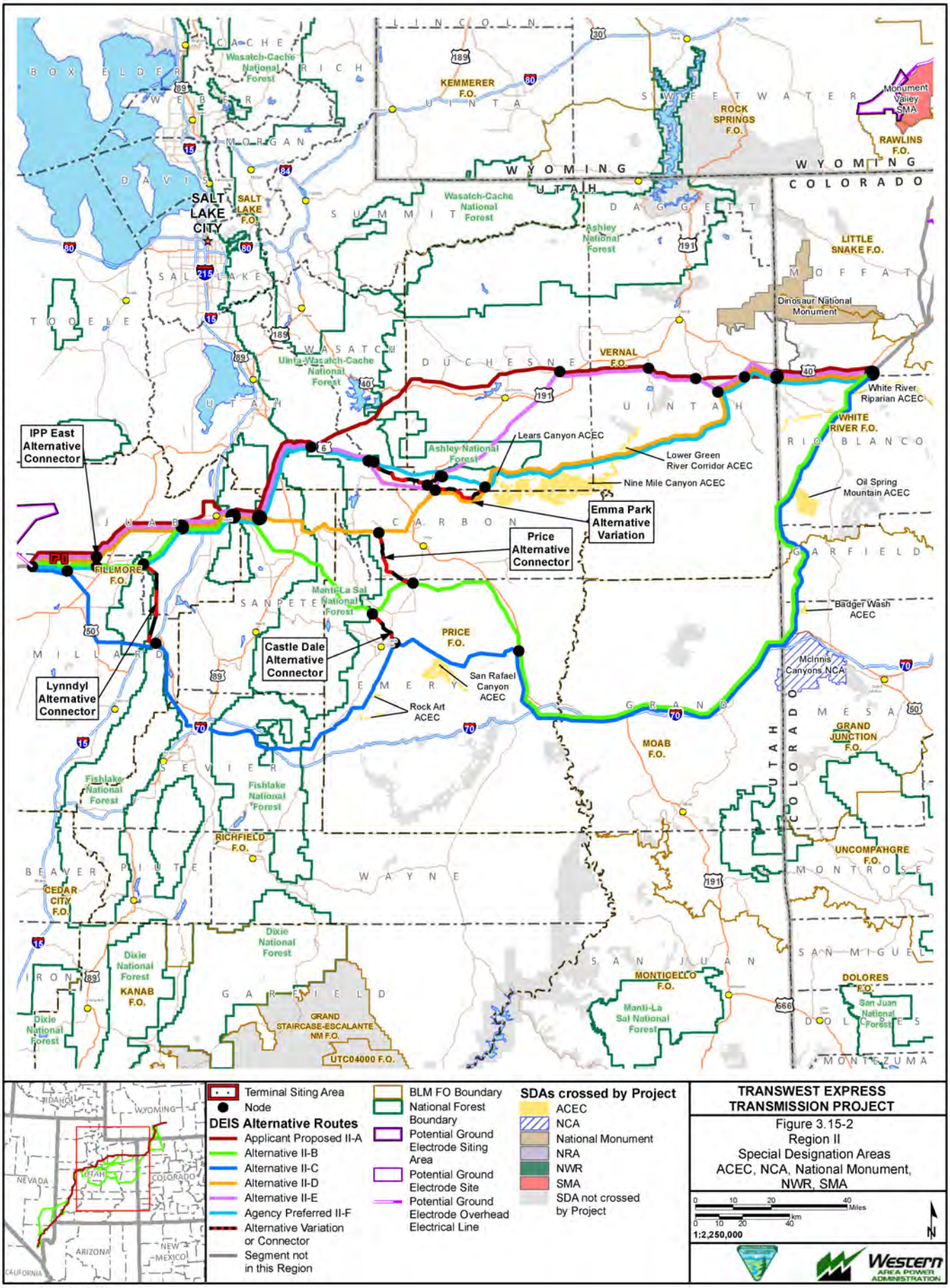

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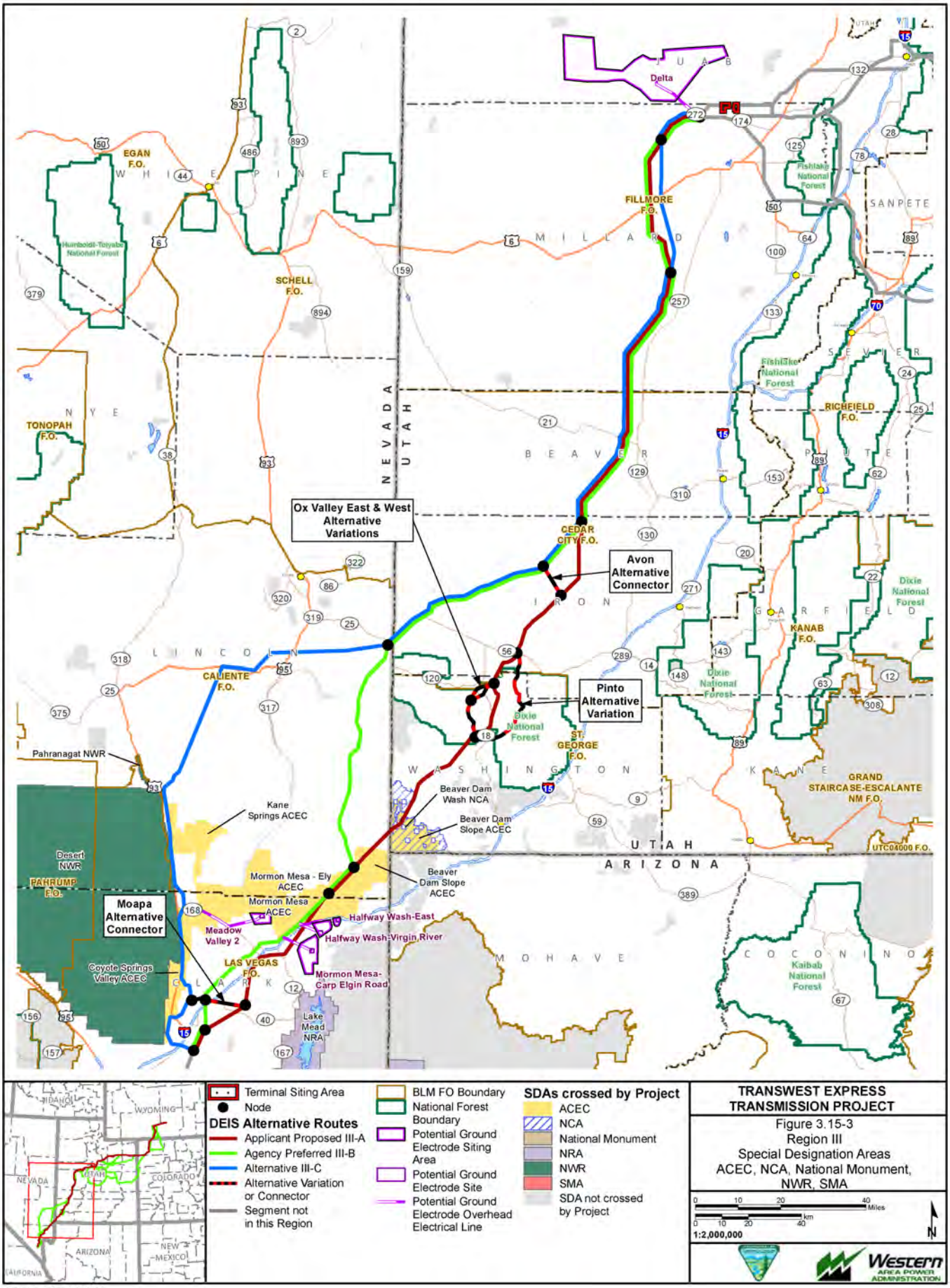

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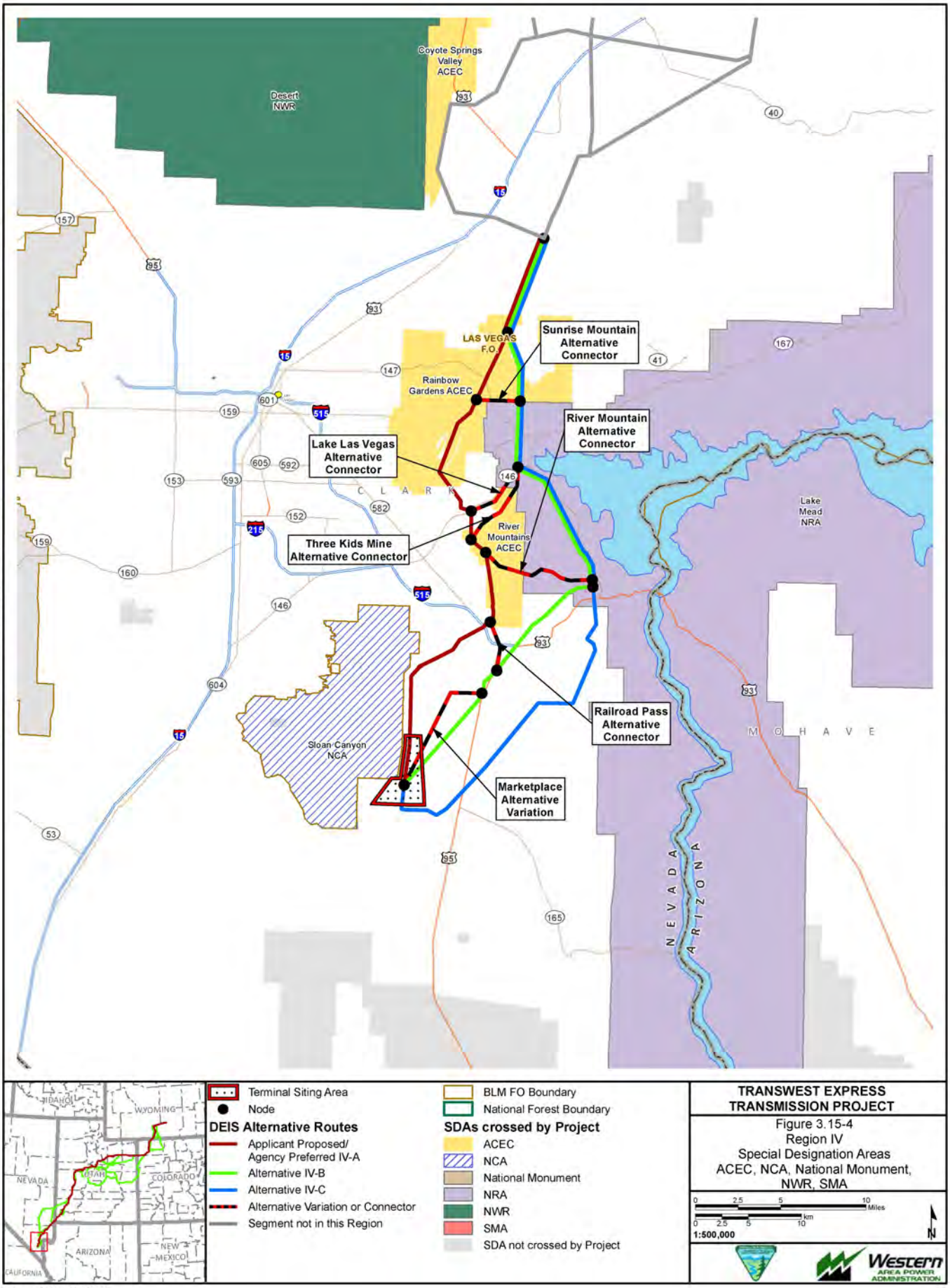

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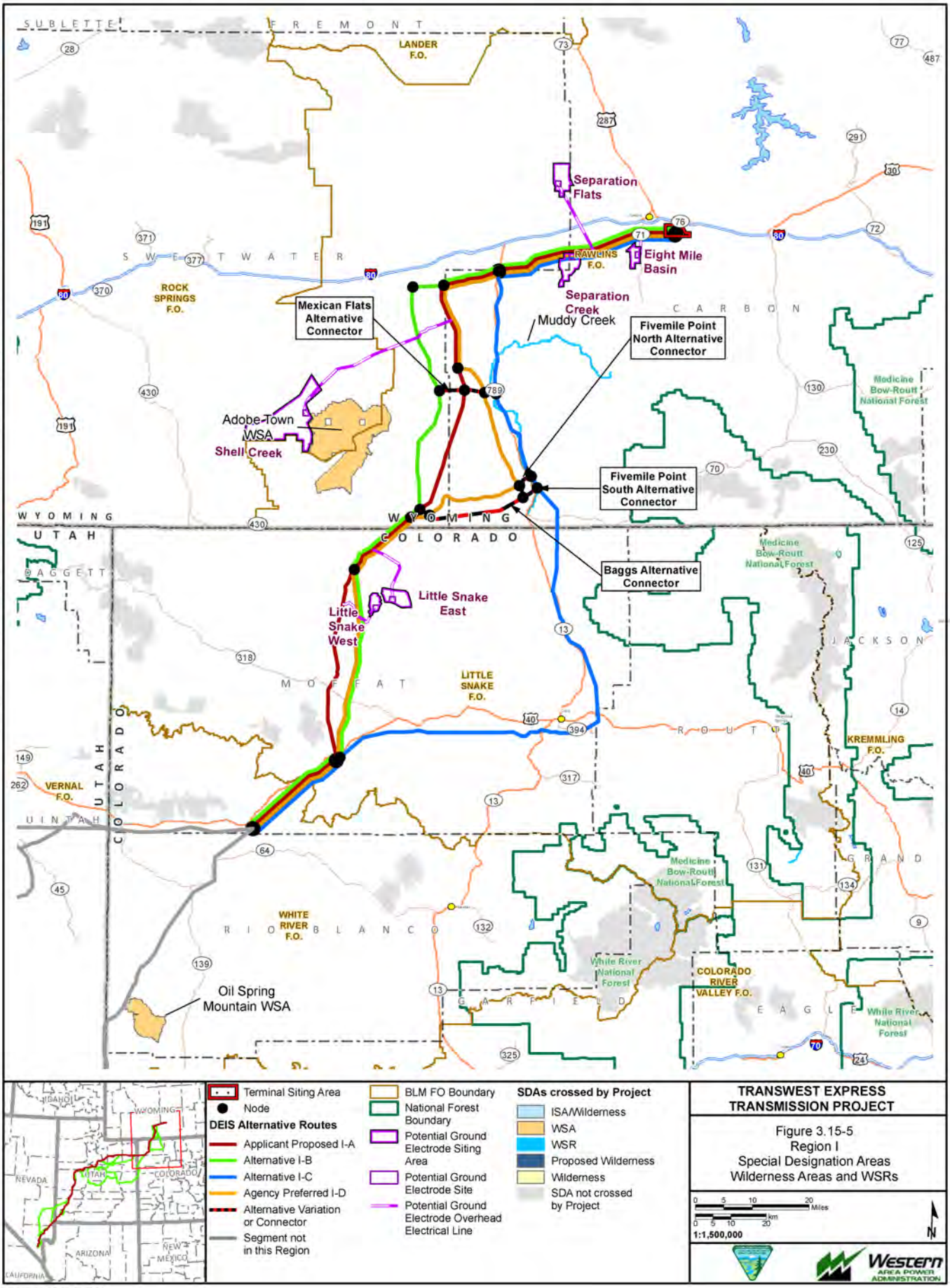
SUBLETTE
FREMONT
LANDER F.O.
Separation Flats
Eight Mile Basin
RAWLINS F.O.
Separation Creek
SWEETWATER
ROCK SPRINGS F.O.
Mexican Flats Alternative Connector
Muddy Creek
Fivemile Point North Alternative Connector
CARBON
Medicine Bow-Routt National Forest
Adobe Town WSA
Shell Creek
Fivemile Point South Alternative Connector
WYOMING
UTAH
COLORADO
Baggs Alternative Connector
Little Snake East
Little Snake West
LITTLE SNAKE F.O.
MOFFAT
JACKSON
ROUTT
KREMMLING F.O.
VERNAL F.O.
UINTAH
GRAND
WHITE RIVER F.O.
RIO BLANCO
Oil Spring Mountain WSA
White River National Forest
COLORADO RIVER VALLEY F.O.
GARFIELD
EAGLE
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
BLM FO Boundary
National Forest Boundary
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
SDAs crossed by Project
ISA/Wilderness
WSA
WSR
Proposed Wilderness
Wilderness
SDA not crossed by Project
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.15-5
Region I
Special Designation Areas
Wilderness Areas and WSRs
Miles
km
1:1,500,000
N
Western AREA POWER ADMINISTRATION
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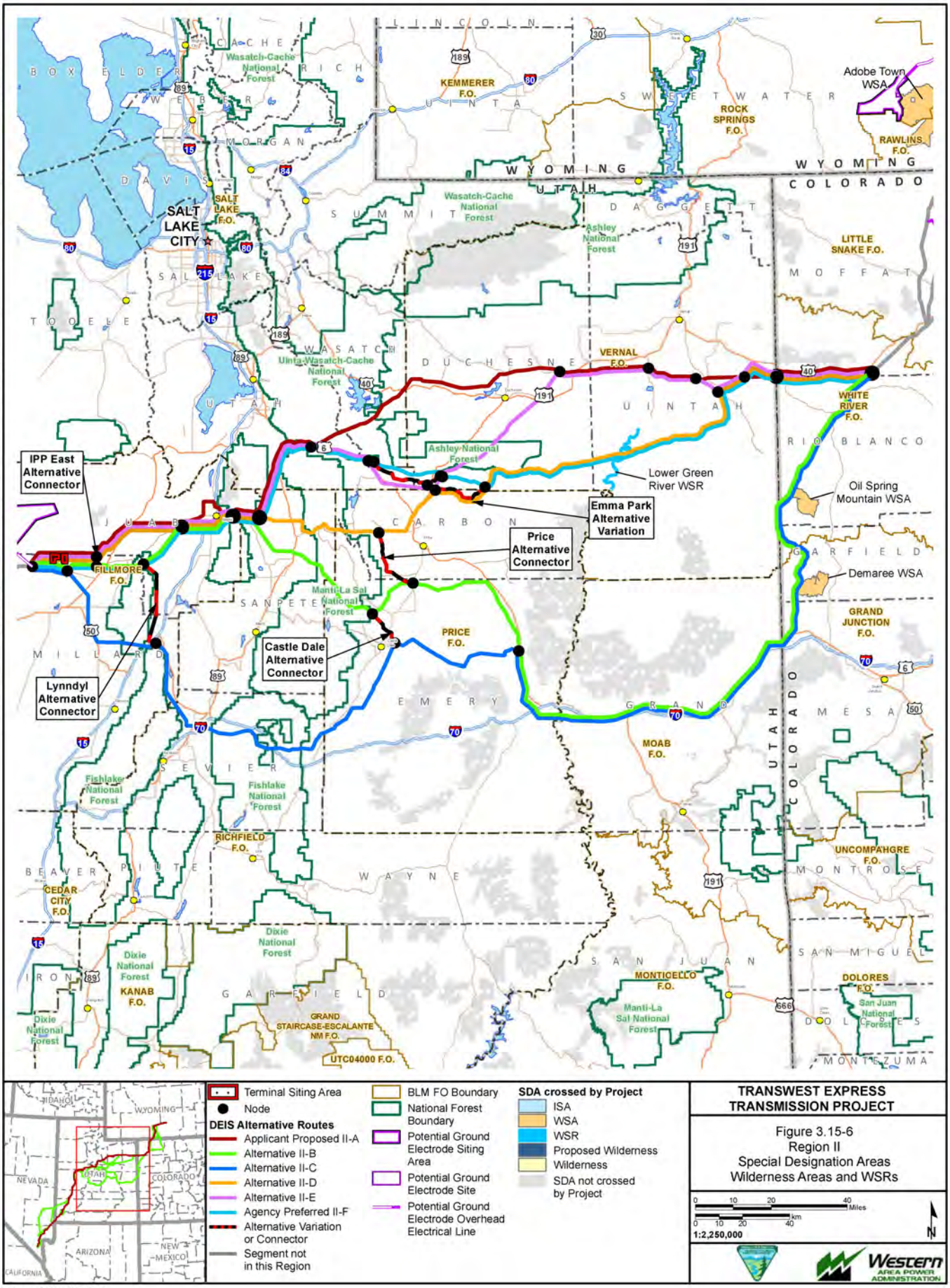
Adobe Town WSA
KEMMERER F.O.
ROCK SPRINGS F.O.
RAWLINS F.O.
WYOMING
COLORADO
UTAH
Wasatch-Cache National Forest
SALT LAKE F.O.
SALT LAKE CITY
Ashley National Forest
LITTLE SNAKE F.O.
VERNAL F.O.
Uinta-Wasatch-Cache National Forest
WHITE RIVER F.O.
IPP East Alternative Connector
Lower Green River WSR
Oil Spring Mountain WSA
Emma Park Alternative Variation
Price Alternative Connector
Demaree WSA
FILLMORE F.O.
Manti-La Sal National Forest
GRAND JUNCTION F.O.
PRICE F.O.
Castle Dale Alternative Connector
Lynndyl Alternative Connector
MOAB F.O.
Fishlake National Forest
RICHFIELD F.O.
UNCOMPAHGRE F.O.
CEDAR CITY F.O.
Dixie National Forest
KANAB F.O.
MONTICELLO F.O.
DOLORES F.O.
San Juan National Forest
GRAND STAIRCASE-ESCALANTE NM F.O.
UTC04000 F.O.
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
BLM FO Boundary
National Forest Boundary
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
SDA crossed by Project
ISA
WSA
WSR
Proposed Wilderness
Wilderness
SDA not crossed by Project
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.15-6
Region II
Special Designation Areas
Wilderness Areas and WSRs
1:2,250,000
Western AREA POWER ADMINISTRATION
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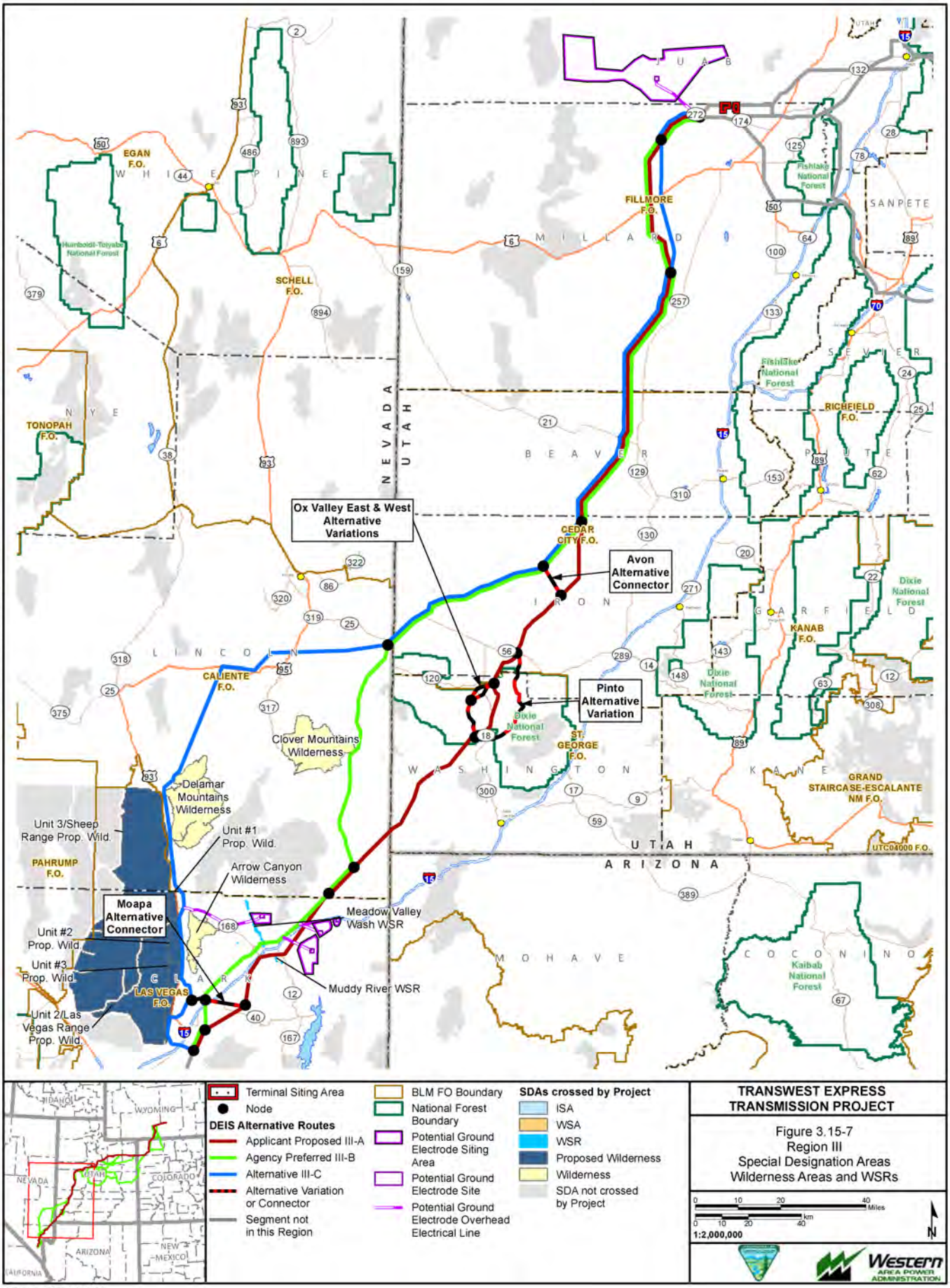

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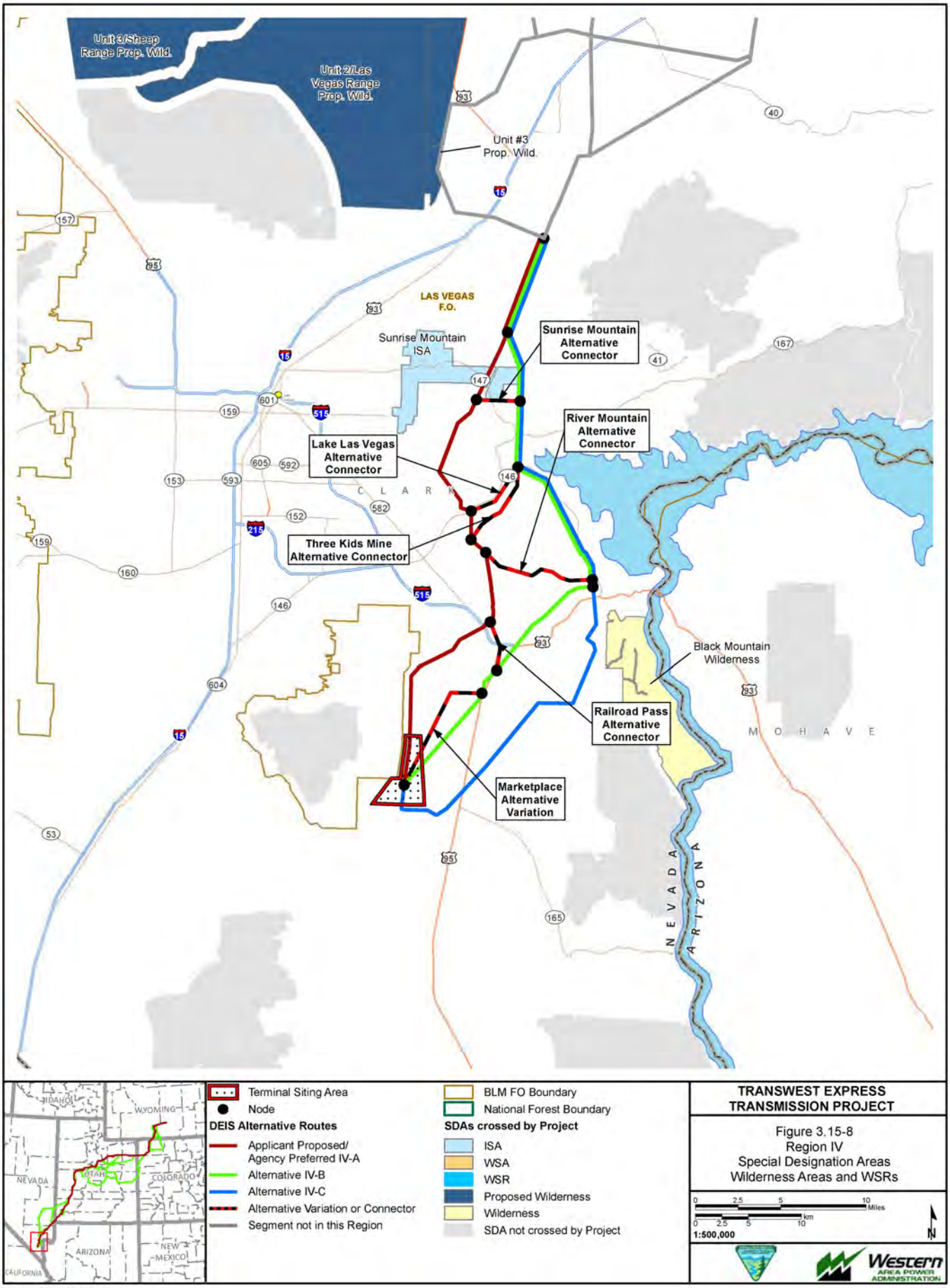

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As part of the Lincoln County Conservation, Recreation, and Development Act of 2004 (PL 108–424), administrative jurisdiction over approximately 8,382 acres of land along the eastern boundary of Desert NWR and west of U.S. Highway 93 was transferred from the USFWS to the BLM for use as a utility corridor.

3.15.3.2 National Monuments

National Monuments, established through the Antiquities Act of 1906, may be presidentially or congressionally designated to protect "objects of historic or scientific interest." The Dinosaur National Monument is the only national monument to occur within the analysis area. It is managed by the NPS.

Per 2006 NPS Park Management Policy, per the Organic Act and the General Authorities Act, actions would not be allowed that would impair integrity of resources or values whose conservation is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or identified in the park's general management plan or other relevant NPS planning documents as being of significance. Before approving a proposed action that could lead to an impairment of park resources and values, an NPS decision-maker must consider the impacts of the proposed action and determine, in writing, that the activity will not lead to an impairment of park resources and values. Actions cannot be approved that individually or cumulatively would:

- Be inconsistent with a park's purposes or values;
- Affect the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process;
- Create an unsafe or unhealthful environment for visitors or employees, or diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values;
- Unreasonably interfere with park programs or activities, or an appropriate use, or the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park; or NPS concessioner or contractor operations or services.

Utility ROWs over lands administered by the Park Service are governed by statutory authorities in 16 USC 5 (electrical power transmission and distribution, radio and TV, and other forms of communication facilities) and 16 USC 79 (electrical power, telephone, and water conduits). If not incompatible with the public interest, rights-of-way issued under 16 USC 5 or 79 are discretionary and conditional upon a finding by the Service that the proposed use will not cause unacceptable impacts on park resources, values, or purposes. ROWs may be issued only pursuant to specific statutory authority, and generally only if there is no practicable alternative to such use of NPS lands.

The Dinosaur National Monument includes more than 200,000 acres of river canyons, mountains, and basins and contains world renowned geological and paleontological resources, important prehistoric petroglyphs and pictographs, and historic-era artifacts. This area also provides habitat for more than 1,000 native species of plants and animals and provides recreational access to the Yampa River (see Section 3.13, Recreation Resources).

The portions of Dinosaur National Monument within Region I are located in the far west portion of the National Monument and include the National Monument entrance from Highway 40 north of Elk Springs, Colorado, and portions of the approximately 12-mile Deerlodge access road closest to Highway 40 (see **Figure 3.15-1**). The ROW for the portion of the Deerlodge road that is within the analysis area is approximately 200 feet wide, and is surrounded by private land. There is an 800-foot scenic easement (400 feet on either side of the road) on portions of Deerlodge Road closer to national monument recreation areas; however, the NPS has not yet purchased the scenic easement within the analysis area.

The average daily traffic using Deerlodge Road is less than 350 vehicles. Most traffic along Deerlodge Road occurs from May through September as rafters and kayakers take advantage of higher flows in the Yampa River from winter snow melt. Deerlodge Road is plowed in the winter, but may be closed during the winter months due to snow and snowdrifts (NPS 2013).

The NPS is currently preparing an EA for a proposed road improvement project, which includes resurfacing, restoring, reconstructing, bank stabilization measures, and installing new drainage measures along Deerlodge Road. The proposed project may be constructed in two phases, depending on available funds. Phase I (proposed for 2013) would include bank stabilization along the Yampa River near milepost 9.5, and Phase II (proposed for 2016) would include the pavement rehabilitation and other parking area modifications (NPS 2013). The portion of Deerlodge road within the analysis area would be upgraded during Phase II.

The portions of the Dinosaur National Monument within Region II comprise a very small portion of national monument lands west of the Harper's Corner entrance road on Highway 40 near Dinosaur, Utah.

3.15.3.3 Wilderness Areas and Wilderness Study Areas

The Wilderness Act of 1964 established the National Wilderness Preservation System and a process for federal agencies to recommend wilderness areas to Congress. Wilderness, as defined by the Wilderness Act, is untrammeled (free from man's control), undeveloped, and natural, offering outstanding opportunities for solitude or primitive and unconfined recreation. Wilderness Areas have been designated within existing national parks, NWRs, national Forests, and BLM-managed public lands to be managed to preserve wilderness characteristics. Agencies typically recommend areas for wilderness designation; however, the public at large can develop its own wilderness proposal for introduction by any member of Congress.

With the passage of FLPMA in 1976, Congress directed the BLM to inventory public land for wilderness characteristics including the appearance of naturalness; outstanding opportunities for solitude or primitive and unconfined recreation; special features and values (such as ecological, geological, educational, historical, scientific, and scenic values), and manageability (adequate size; i.e., at least 5,000 acres of public lands or of sufficient size to make preservation practicable). WSAs contain wilderness characteristics and are managed to preserve those values until Congress either designates them as wilderness or releases them for other uses. ISAs are areas formally identified as "natural" or "primitive" prior to the passage of the FLPMA. These are lands identified by the wilderness review required by Section 603 of the FLPMA and for all intents and purposes are managed as WSAs until Congress either designates them as wilderness or releases them for other purposes. Four wilderness areas, three WSAs, and one ISA are located on BLM land within the analysis area. Additional information on WSAs and ISAs is presented in Section 3.12, Visual Resources.

The USFWS conducts wilderness reviews to identify and recommend Refuge System lands and waters for congressional designation. Five portions within the Desert NWR complex have been proposed for wilderness status via the National Wilderness Preservation System. See **Table 3.15-1** and **Figures 3.15-5** through **3.15-8**.

Table 3.15-1 Designated Wilderness, Wilderness Study Areas, and Proposed Wilderness within Special Designations Analysis Area

Region	State	Management Entity	Name	Area Designation	Acreage
I	Wyoming	Rock Springs FO	Adobe Town	BLM WSA	87,051
II	Colorado	Grand Junction FO	Demaree[1]	BLM WSA	21,050
	Colorado	White River FO	Oil Spring Mountain[1]	BLM WSA	18,260

Table 3.15-1 Designated Wilderness, Wilderness Study Areas, and Proposed Wilderness within Special Designations Analysis Area

Region	State	Management Entity	Name	Area Designation	Acreage
III	Nevada	Caliente FO	Delamar Mountains	Designated Wilderness	111,328
	Nevada	Caliente FO	Clover Mountain	Designated Wilderness	85,748
	Nevada	USFWS	Unit #1	Proposed Wilderness	7,663
	Nevada	USFWS	Unit #2	Proposed Wilderness	17,404
	Nevada	USFWS	Unit #3	Proposed Wilderness	21,989
	Nevada	USFWS	Unit 2/Las Vegas Range	Proposed Wilderness	127,596
	Nevada	USFWS	Unit 3/Sheep Range	Proposed Wilderness	375,458
	Nevada	Las Vegas FO	Arrow Canyon	Designated Wilderness	27,585
IV	Nevada	Las Vegas FO	Black Mountain	Designated Wilderness	17,220
	Nevada	Las Vegas FO	Sunrise Mountain[1]	BLM ISA (ISA; NV-050-0420)	10,240

[1] Managing entity does not recommend area for future wilderness designation.

Source: BLM 2008a,b; 1997a,b; 1987.

3.15.3.4 Wild and Scenic Rivers

WSRs were established by the Wild and Scenic Rivers Act of 1968 to protect and preserve designated rivers throughout the nation in their free-flowing condition and to protect and preserve their immediate environments. To meet the eligibility criteria, a waterway must be “free-flowing” and, along with its adjacent land area, must possess at least one “outstandingly remarkable value.” The Act provides three levels of protection: wild, scenic, and recreational. “Wild” rivers are free of dams, generally inaccessible except by trail, and represent vestiges of primitive America. “Scenic” rivers are free of dams, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. “Recreational” rivers are readily accessible by road or railroad, may have some development along their shorelines, and may have been dammed in the past.

Within the Rawlins FO (Region I, see **Figure 3.15-5**), the Muddy Creek was determined eligible for WSR “recreational” status, based on hydrological factors such that the evaluated portions of the creek serve as a “textbook” example of stream rehabilitation for land managers. However, the Rawlins FO ultimately determined that the creek segments did not meet suitability factors and would be given no further consideration for inclusion within the National Wild and Scenic Rivers System (NWSRS) (BLM 2002). Accordingly, this stream has not been carried forward for analysis in this EIS.

Portions of the Lower Green River (Region II, BLM Vernal FO) within the analysis area have been found to be eligible and recommended as suitable for inclusion into NWSRS and are shown on **Figure 3.15-6**. The Lower Green River segment (30 miles) extends from the public land boundary south of Ouray, Colorado, to the Carbon County line in Utah. The Lower Green segment continues through the Price FO to just north of Green River, Utah, for a total of 115 miles. There is a tentative classification of "Scenic" for both river segments.

The Lower Green River segment is largely protected from mineral development disturbance by either being closed to mineral leasing or by no surface occupancy (NSO) stipulations. NSO stipulations within the Vernal FO correlate with ROW avoidance areas. The river segments are in a limited or closed OHV category, with most of the segments limited to designated routes. The Lower Green River is protected with both Class I

and II VRM categories (see Section 3.12, Visual Resources, for a description of visual management categories). The Price FO segment of the Lower Green River is outside of the analysis area.

Within the Las Vegas FO (Region III, see **Figure 3.15-7**), there are two rivers that have been designated as eligible for the NWSRS and are protected under the Wild and Scenic Rivers Act until a suitability analysis has been completed. The suitability analysis will be completed as part of the RMP amendment process, which currently is underway. There is a tentative classification of "recreational" for an 11-mile section of the Muddy River and a tentative classification of "scenic" for an 11-mile Meadow Valley Wash riparian area. Both rivers have outstanding remarkable wildlife, cultural, and fish features. Suitability of these river segments has not yet been determined.

Table 3.15-2 provides an overview of classification criteria for “scenic” and “recreational” designations. Per BLM Manual 8351, which provides direction for identification, evaluation, and management of WSRs, new transmission lines, natural gas lines, etc., are discouraged unless specifically authorized by other plans, orders, or laws. Where no reasonable alternate location exists, additional or new facilities should be restricted to existing ROWs. Where new ROWs are unavoidable, locations and construction techniques shall be selected to minimize adverse effects on wild, scenic, or recreational river area related values and fully evaluated during the site selection process. These requirements also apply to river segments that have been found to be eligible for consideration as components of the NWSRS through the RMP process, but for which suitability has not yet determined.

Table 3.15-2 Classification Criteria for WSR “Scenic” and “Recreational” Areas

Criteria	Scenic	Recreational
Accessibility	Accessible in places by road. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.
Shoreline Development	Largely primitive and undeveloped No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production, or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank.	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.
Water Resource Development	Free of impoundment	Some existing impoundment or diversion. The existence of low dams, diversions, or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.

Table 3.15-2 Classification Criteria for WSR "Scenic" and "Recreational" Areas

Criteria	Scenic	Recreational
Water Quality	No criteria prescribed by the Wild and Scenic Rivers Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all WUS be made fishable and swimmable. Therefore, rivers will not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is being developed in compliance with applicable Federal and State laws.	

Source: BLM 2008c.

3.15.3.5 National Conservation Areas

NCAs are designated by Congress to conserve, protect, enhance, and manage public lands for the benefit and enjoyment of present and future generations. **Table 3.15-3** identifies the three BLM NCAs within the analysis area, which include the McInnis Canyons NCA in Colorado (**Figure 3.15-2**), the Beaver Dam Wash NCA in Utah (**Figure 3.15-3**), and the Sloan Canyon NCA, in Nevada (**Figure 3.15-4**).

Table 3.15-3 BLM National Conservation Areas

Region	Name	Management Description
Region II	McInnis Canyons NCA (123,400 acres)	Managed for the core objective of multiple uses, allowing for as wide a range of activity as possible, while protecting the resources of the CCNCA for future use and enjoyment. Per the Colorado Canyons NCA RMP (BLM 2004), "ROW proposals will be reviewed and approved on a case-by-case basis and will be subject to constraints, sensitive resource areas, and issues identified in the Colorado Canyons NCA RMP and other applicable documents and policies." Utility line proposals, from the I-70 corridor to the Colorado River or in the upper Black Ridge road area, will be required to be located underground and along the edge of or within roadways, or within the railroad ROW. Additions or modifications to aboveground utilities will only be considered within the existing utility corridors where aboveground facilities presently exist. Underground utility proposals also will be considered in these existing corridors.
Region III	Beaver Dam Wash NCA (63,500 acres)	Managed to protect important biological, ecological, historical, and scenic resources as well as diverse recreational opportunities. The NCA also provides critical habitat for Mojave Desert tortoises, a federally threatened species. Three major utility corridors, excluded from the NCA, contain roads that access electrical and natural gas transmission lines and fiber-optic cable lines. Per the St. George RMP, new ROW and temporary use permits are strongly discouraged within the Beaver Dam Slope ACEC and shall only be authorized if no reasonable alternative exists and impacts to tortoises and their habitat can be mitigated. Surface disturbance (before restoration) resulting from all ROW in the ACECs shall not exceed 40 acres through the life of the project. Construction of unpaved roads could occur only if positive benefits to tortoise management would occur and would require concurrence from the USFWS. Paving would not be allowed. Speed limits exist within the ACEC. The BLM St. George Field Office is preparing a Management Plan to address recreation uses and facilities while protecting the special values of the NCA.
Region IV	Sloan Canyon NCA (48,000 acres)	Managed to conserve, protect, and enhance the cultural, archaeological, natural, wilderness, scientific, geological, historical, biological, wildlife, educational, and scenic resources of this area. Established in 2002, the conservation area encompasses approximately 48,000 acres. The area features significant archaeological sites, scenic vistas, important wildlife habitat, and opportunities for primitive recreation.

BLM 2004, 1999.

3.15.3.6 National/State Scenic Byways and Backways

National or state scenic byways and backways provide an opportunity for the public to experience landscapes with significant outstanding scenic, historic, cultural, natural, recreational, and archaeological qualities. Impacts to scenic byways and backways are discussed in Section 3.12, Visual Resources, and Section 3.13, Recreation.

3.15.3.7 Designated National Trails

Introduction

The National Trails System is a network of historic, scenic, and recreation trails created by the National Trails System Act of 1968 (as amended) to "promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open air, outdoor areas and historic resources of the Nation" [16 USC 1241].

- A *national scenic trail* is a congressionally designated trail that is a continuous and uninterrupted extended, long-distance trail so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant resources, qualities, values, and associated settings and the primary use or uses of the areas through which such trails may pass. NSTs may be located so as to represent desert, marsh, grassland, mountain, canyon, river, forest, and other areas, as well as landforms that exhibit significant characteristics of the physiographic regions of the Nation (BLM Manual 6280).
- A *national historic trail* is a congressionally designated trail that is an extended, long-distance trail, not necessarily managed as continuous, that follows as closely as possible and practicable the original trails or routes of travel of national historic significance. The purpose of a National Historic Trail is the identification and protection of the historic route and the historic remnants and artifacts for public use and enjoyment. A National Historic Trail is managed in a manner to protect the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, including the primary use or uses of the trail (BLM Manual 6280).
- A *national recreation trail* is a trail designated by the Secretary of the Interior, or delegated officer, through a standardized process, including a recommendation and nomination by the BLM. National Recreation Trails provide a variety of compatible outdoor recreation uses in or reasonably accessible to urban areas or high-use areas. (BLM Manual 6280). National recreation trails are discussed in Section 3.13, Recreation.

Within the analysis area, there is one NST and one NHT:

- Old Spanish NHT (located within Region II and Region III)
- CDNST (located within Region I)

Additionally, the Overland and Cherokee trails are currently under a feasibility study to be amended to the California NHT. Both trails are located within Region I.

National Trail Management

NSTs and NHTs are formally administered by the NPS, BLM, or USFS; however, the land along the national trails is in both public and private ownership and may include tribal lands. In 2006, a memorandum of understanding (06-SU-11132424-196) was signed by the BLM, NPS, USFWS, USFS, USACE, and FHWA to encourage long-term interagency coordination under the authority of the National Trails System Act of 1968. Subsequent to this memorandum, the BLM has developed a series of National Trails System manuals (BLM Manuals 6250, 6280, and 8353) to provide administrative and management guidance. Once congressionally designated, administering agencies are required to develop a Comprehensive Management Plan (CMP) or trailwide Comprehensive Plan. BLM policy establishes that the CMP or trailwide

Comprehensive Plan is a strategic document through which the administration agency defines the nature and purpose(s) of the trail, selects the National Trail ROW, and provides general aspirational goals for the National Trail. If developed, the trailwide CMP (and other reference documents), is then used to provide information about national trails in the development of land use planning documents (e.g., BLM FO RMPs and USFS LRMPs). For the BLM, in cases where a trail is under study or has been recommended as suitable for designation and Congress has not yet acted to designate the trail, the appropriate federal agency manages the values, characteristics, and settings of the trail in accordance with FLPMA.

To date, the Old Spanish NHT does not have a trailwide Comprehensive Plan. A Comprehensive Plan was prepared for the Continental Divide NST in 1985 and amended in 2009.

Analysis Considerations for National Trails

Federal agencies must consider the effects of proposed actions on NSTs and NHTs under NEPA and the National Trails System Act of 1968 [16 U.S.C. 1246]. The law states that “other uses along the trail, which will not substantially interfere with the nature and purposes of the trail, may be permitted by the Secretary charged with the administration [management] of the trail. Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable, efforts shall be made to avoid activities incompatible with the purposes for which such trails were established.” In addition, Section 9 (a) [16USC1248] states that “The Secretary of the Interior or the Secretary of Agriculture as the case may be, may grant easements and rights-of-way upon, over, under, across, or along any component of the national trails system in accordance with the laws applicable to the national park system and the national forest system, respectively: Provided, That any conditions contained in such easements and rights-of-way shall be related to the policy and purposes of this Act.” Analysis considerations for Designated National Trails under NEPA and the National Trails System Act of 1968 [16 U.S.C. 1246], include:

- The extent to which the proposed action would affect the BLM’s ability to effectively manage the nature and purposes of the trail, trail resources, qualities, values, uses (including public access and enjoyment) and associated settings; and
- The extent to which a proposed action would require a major relocation of the National Trail Management Corridor in order to provide for the conservation and enjoyment of the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, or the primary use or uses of the trail.

Additional Considerations for National Historic Trails

NHTs differ from "regular" trails, which generally can be described, inventoried, and managed as one linear route. The Federal Geographic Data Committee Federal Trail Data Standards describe NHTs as an informal "corridor," rather than a single line on a map. Each “NHT corridor” is comprised of the trail route (both congressionally designated as well as the route and sites where history actually occurred if different from the designated route), associated heritage sites, and recreation and/or interpretive trail/road/sites that people can use.

Per BLM Manual 6280, NHTs are to be managed “to recognize the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, including the primary use or uses of the trail. Federal Protection Components associated with the National Historic Trail, including high potential historic sites, and high potential route segments, as well as auto tour routes are identified by the National Trail administering agency through the trailwide Comprehensive Plan.” The National Trails System Act of 1968 and other applicable legislation defines “high potential routes” as those offering visitors a high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of an historic route. “High potential historic sites” refers to those sites related to the route or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use. To meet the goals of the National Trails System Act for NHTs, federal agencies must identify and protect not only the

physical remnants of high potential route segments and high potential historic sites (16 USC 16 1251) associated with the route, but its nature and purposes as well.

Three primary assessment tools are used to characterize NHTs: Condition Category classification, VRI data, and historic integrity assessments.

The NHT Condition Categories are federal standard classifications designed to assess the comparative character of visible trail remnants observed at the time of mapping for all NHTs. NHT Condition Categories Encompass: 1) documentation of the historic location; and 2) presence (or lack) of visible trail remnants and/or artifacts that provide evidence of the historic route. There are six NHT Condition Categories:

- NHT I – Location verified, evident, and unaltered
- NHT II – Location verified and evident with minor alteration
- NHT III – Location verified with little remaining evidence
- NHT IV – Location verified and permanently altered
- NHT V – Location approximate or not verified
- NHT VI – Location verified with historic reconstruction

NHT Condition Categories are applicable to the heritage resource component of the NHT and not to the recreation or interpretive components, and do not reflect the character or integrity of the NHT setting or surrounding landscape.

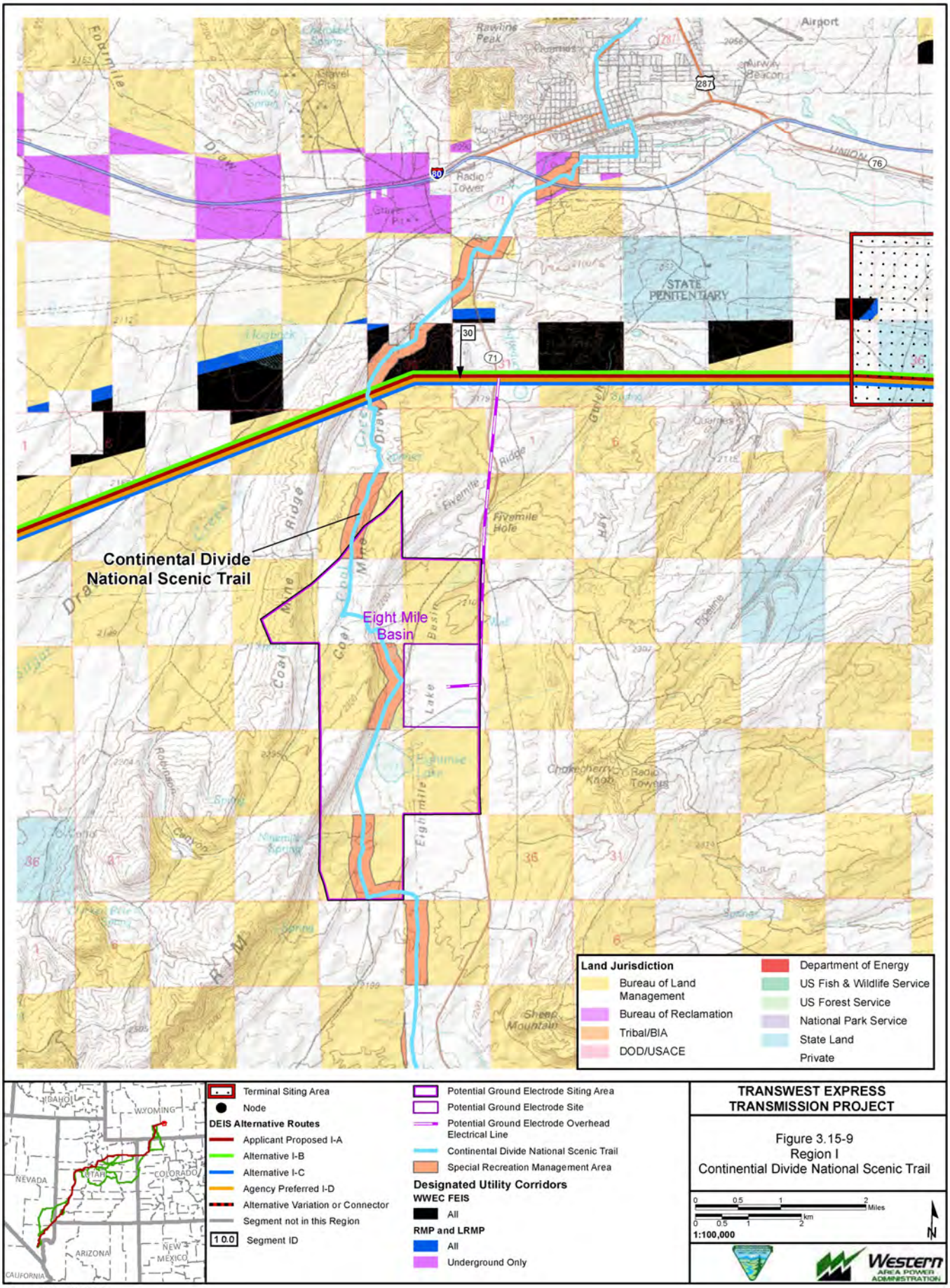
The VRI process provides land managers with a means for determining visual values. VRI classes represent the relative value of the visual resources and provide the basis for considering visual values in the resource management planning process. In the BLM or USFS VRI process, public lands are divided into Scenic Quality Rating Units (SQRUs) and rated on apparent scenic quality, which is determined using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. Class A: 19 or more points, B: 12-18 points, Class C: 11 or less points. Section 3.12, Visual Resources, provides more information regarding VRI. As discussed in Section 3.12, Visual Resources, the Project would result in no less than a minus four (-4) points in total. Thus, Class A could be reduced to Class B based on an existing SQRU score of 19 to 22, and Class B could be reduced to Class C if the existing SQRU were in the12 to 15 point range.

The NRHP defines historic integrity as “a property’s historic identity evidenced by the survival of physical characteristics from the property’s historic or pre-historic period. The seven qualities of integrity are location, setting, feeling, association, design, workmanship, and materials.” Historic Integrity is determined by the extent to which the general character of the historic period is evident and the degree to which incompatible features obscuring that character are present (and in some cases, whether they can be reversed) (AECOM 2012).

<u>National Trails within the Analysis Area</u>

Continental Divide National Scenic Trail

There is one NST within Region I of the analysis area: the CDNST **(Figure 3.15-9**). The 3,100-mile CDNST runs along the Rocky Mountains from Canada to Mexico. Administered by the USFS, a CMP was developed in 1985 and amended in 2009. As stated in the CMP, the trail’s nature and purpose is “to provide for high-quality scenic, primitive hiking and horseback riding opportunities and to conserve natural, historic, and cultural resources along the CDNST corridor” (USFS 2009a). The Rawlins FO RMP also provides management actions to emphasize interpretive and education opportunities, including designation of a 600-acre CDNST SRMA to emphasize interpretive and educational opportunities and to ensure the



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continued availability of outdoor recreation opportunities associated with the trail. The SRMA contains the 82 miles of CDNST located on federal lands within the Rawlins FO. Recreation activities within the SRMA include backpacking, mountain biking, camping, hunting, OHV use, picnicking, and wildlife viewing. The SRMA is an avoidance area for linear utility systems.

The portion of the CDNST alignment and SRMA that potentially would be crossed by the Project is located south of Rawlins, Wyoming, approximately 3 miles south of Interstate Highway 80. The general area includes dispersed residential development, an existing transmission line and RMP-designated utility corridor, a state penitentiary, and a variety of industrial facilities. As a result, there are limited recreation opportunities along this section of the trail. The Rawlins FO's VRI has given this area a rating of Class B (medium, with a score of 17).

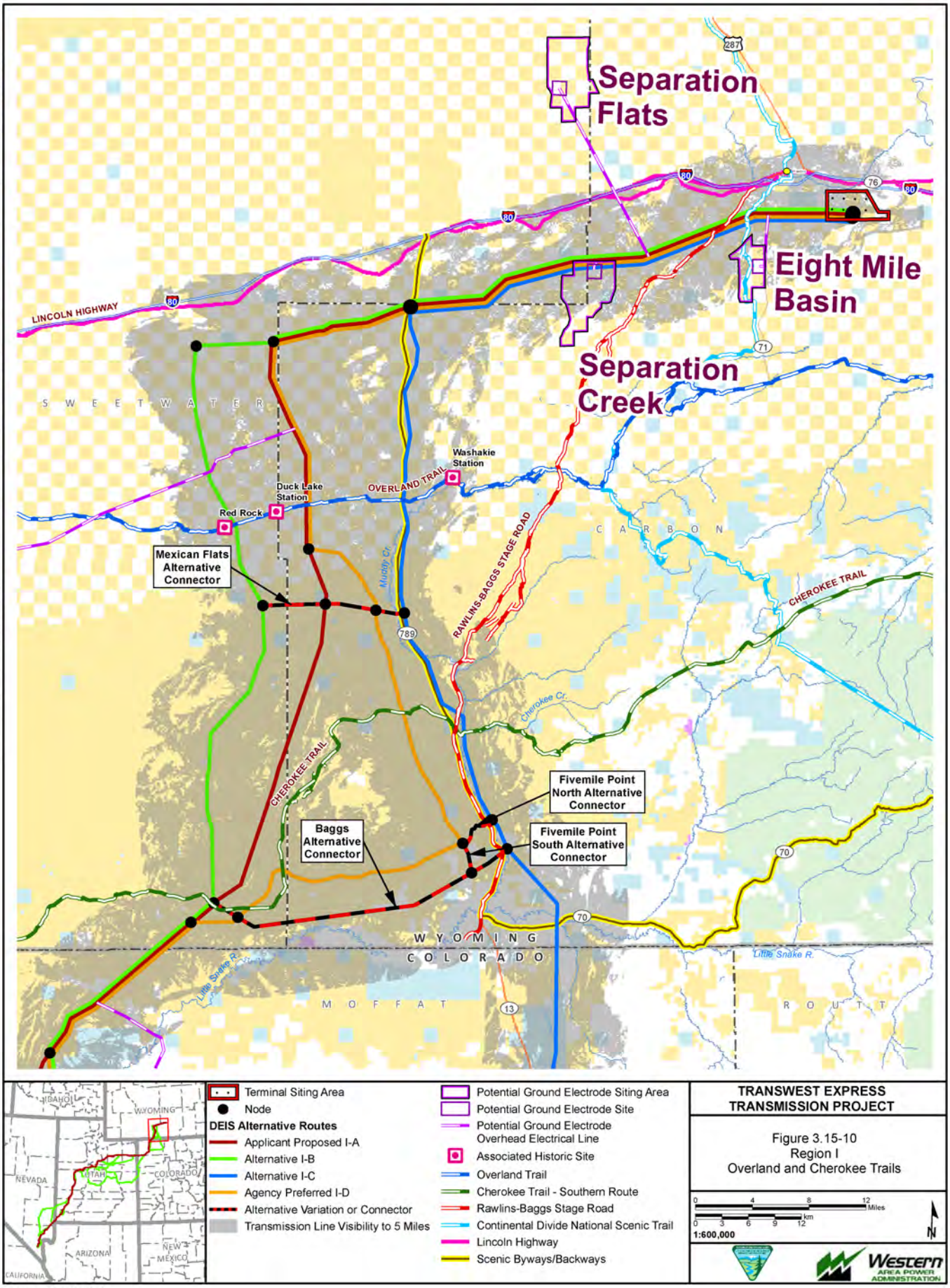
Overland and Cherokee Trails (Potential National Trails)

The Cherokee Trail is most commonly known for its use as an alternative route to the Oregon Trail, but it also served as a transportation route for freight, cattle, and passengers between Utah and Colorado to the Union Pacific Railroad in Wyoming. One segment of the southern route of the Cherokee Trail eventually became known as the Overland Trail, which was heavily used by emigrants and prospectors largely as an alternative route to the Oregon Trail. The Overland and Cherokee trails currently are under a feasibility study to be amended to the California NHT (Four Trails Feasibility Study Revisions/Environmental Assessment project: Revisions to Feasibility Studies for Oregon, Mormon Pioneer, California, and Pony Express NHT). A CMP was developed by the NPS for the California NHT in 1999, which likely would be modified after the completion of the feasibility study for the Overland and Cherokee Historic Trails. As stated in the California NHT 1999 CMP, the nature and purpose of the California NHT is to "enable all people to envision and experience, in a coherent and convenient way, the heritage and impacts on the western overland migration" (NPS 1999).

The BLM Rawlins FO has provided management direction in their 2008 RMP to protect resources associated with these historic trails, including a NSU stipulation within 0.25 mile or the visual horizon to the trail, whichever is closer (see **Appendix C**). The RMP also stipulates that actions resulting in linear crossings of the trails will occur in previously disturbed areas and will be managed in accordance with BMPs. The RMP provides no management with regard to compliance with the BLM National Trails Manuals series, recently released. NHT Condition Category and historic integrity assessment data are not available for these trails.

The Overland Trail traverses the Rawlins FO for approximately 18 miles and generally is parallel to I-80. There are three portions of the Overland Trail that potentially would be crossed by the Project alternatives within Region I. **Figure 3.15-10** shows the location of the Overland and Cherokee trails as related to the alternatives. From east to west, the trail crossing locations would be as follows:

- Along Highway 789, approximately 18 miles south of the intersection of Highway 789 and I-80.The 38-mile section of Highway 789 from Baggs to I-80 is part of the 205 mile Outlaw Trail Scenic Highway. There is an interpretive sign located on Highway 789 where the Overland Trail crosses the highway. The trail crossing would be located on private land within the confines of a designated utility corridor. Scenic quality is low in this area (Class C, with an SQRU score of 6). East of Highway 789, the Overland Trail generally parallels the Muddy Creek. Washakie Station, one of the few associated historic sites with standing ruins, is located less than 4 miles east of the highway.
- Approximately 16 miles south of Wamsutter, Wyoming, about 1 mile west of the Overland Trail's intersection with Wamsutter Road. The crossing would be located approximately 0.4 mile south of the Eureka Headquarters road and directly adjacent to an unnamed oil and gas access road. The Duck Lake Station, an associated historic site, would be about 4 miles to the west of the crossing. Nothing remains at this site. There are no associated recreation areas located near these trail segments and there are numerous well pads and an access road in the area. Scenic quality is low



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in this area (Class C, with an SQRU score of 6). The trail crossing would be located on BLM land, but would not be within a designated utility corridor.

- Approximately 16 miles south of Wamsutter, Wyoming, about 6 miles west of the Overland Trail's intersection with Wamsutter Road and immediately adjacent to the Eureka Headquarters road. Scenic quality is low in this area (Class C, with an SQRU score of 8). Duck Lake Station would be about 1.5 miles to the east of the proposed crossing. Red Rock, a historical inscription site, would be about 3.25 miles to the west of the proposed crossing, on private land. There are no recreation areas or interpretive features located near these trail segments. There are numerous well pads and access road in the area. The trail crossing would be located on private land within the confines of a designated underground utility corridor.

The Cherokee Trail traverses the Rawlins FO in an east-west direction, crossing Highway 789 approximately 6 miles south of Dad, Wyoming, and 15 miles north of Baggs, Wyoming. The Cherokee Trail continues west just north of Flat Top Mountain, then drops to the southwest and follows the Powder Rim along a series of small washes. There are five portions of the Cherokee Trail that potentially would be crossed by the Project alternatives. From east to west, the trail crossing locations would be as follows:

- Approximately 12 miles north of Baggs and less than 1 mile east of Highway 789. The trail crossing would be directly to the east of Muddy Creek and to the south of Cherokee Creek (which generally parallels the Cherokee Trail route in this area). These two perennial water sources are associated with the Cherokee Trail in that they undoubtedly influenced its location. There are no interpretive signs located on the Highway and no associated historic sites located near these trail segments. The trail crossing would be located in BLM lands, immediately east of (but outside of) a designated utility corridor. Scenic quality is average in this area (Class B, with an SQRU score of 12).
- Approximately 14 miles north of Baggs and approximately 3 miles west of Highway 789. The trail crossing would be 4 miles east of North Flat of Mountain and adjacent to an oil and gas access road. There are no associated historic sites, recreation areas, or interpretive features located near these trail segments. The trail crossing would be located on BLM land and would not be within a designated utility corridor. Scenic quality is average in this area (Class B, with an SQRU score of 12).
- Approximately 13 miles west of Baggs, Wyoming, near the convergence of Shell Creek Stock, Poison Butte, and W. Hangout Roads. The Cherokee Trail is located in a wash that ultimately drains into the Little Snake River. There are no associated historic sites, recreation areas, or interpretive features located near these trail segments. The trail crossing would be located on BLM land and would not be within a designated utility corridor. Scenic quality is low in this area (Class C, with an SQRU score of 9.5).
- Approximately 18 miles west of Baggs, Wyoming, and southeast of the Cherokee Trail Road. There are no associated historic sites, recreation areas, or interpretive features located near these trail segments. The trail crossing would be located on BLM land within a designated underground utility corridor. Scenic quality is average in this area (Class B, with an SQRU score of 12).
- Approximately 3.5 miles southwest of the crossing near Creek Stock/ Poison Butte / W. Hangout Roads and 2.5 miles southeast of the crossing 18 miles west of Baggs. There are no associated historic sites, recreation areas, or interpretive features near trail segments in this area. The trail crossing would be on BLMs lands and would not be within a designated utility corridor. Scenic quality is average in this area (Class B, with an SQRU score of 12).

Old Spanish National Historic Trail

The Old Spanish NHT was designated as such on December 4, 2002, by the Old Spanish Trail Recognition Act of 2002, to be co-administered by the BLM and NPS. The NHT consists of a trail network overlain on Native American trails that crossed the expanse of the Colorado Plateau and the Mojave Desert, followed by trappers and traders from the 1820s through 1840s to reach a variety of destinations, including but not

limited to California. Much of the network was later incorporated into improved wagon road travel routes. There are portions of the Old Spanish NHT in Regions II, III, and IV; however, inventoried analysis units (AUs) only occur in Regions II and III.

Although no Class III inventories or in-depth visual analyses have been conducted to date for the Project, the EIS analysis of impacts to the Old Spanish NHT was supported with data obtained from the National Historic Trails Inventory Project (AECOM 2012). The 2012 National Historic Trails Inventory Project was not conducted for the Project, but was a separate endeavor conducted by the BLM using American Recovery and Reinvestment Act (ARRA) funding and staff resources to develop and apply new inventory and management tools that include consistent standards for trail resource documentation, protection, use, and preservation. A total of six NHTs across the western U.S. were investigated as part of the 2012 NHT Inventory. Of these six trails, only the Old Spanish NHT is located within the analysis area.

The Old Spanish NHT inventory is organized by 52 distinct AUs (i.e., selected route segments, sites, features, or trail resources). Each trail segment within an AU was categorized under the NHT Condition Categories. In order to identify high potential route segments, the 2012 National Historic Trail Inventory Project considered NHT Condition Category in conjunction with two setting components, scenic quality and the historic integrity of the setting (described earlier in this section). These were combined to result in a composite setting rating.

	Scenic Class A	Scenic Class B	Scenic Class C
Retains Integrity	SI	SI	SII
Diminished Integrity	SII	SIII	SIII

The composite setting rating was then arrayed against NHT Condition Category to derive an overall rating.

	SI	SII	SIII
NHT I/II	Exceptional Expression of Northern Terminal Siting Area Values	Exceptional Expression of Northern Terminal Siting Area Values	Notable Expression of Northern Terminal Siting Area Values
NHT III	Notable Expression of Northern Terminal Siting Area Values	Evident Expression of Northern Terminal Siting Area Values	High potential segment
NHT IV-VI	Evident Expression of Northern Terminal Siting Area Values	High potential segment	High potential segment

The following sections discuss the general location of the Old Spanish Trail by region; agency management of the portions of the trail within the analysis area; and the trail resources, qualities, values, uses (including public access and enjoyment), and associated settings within the analysis area.

Region II Analysis Area Old Spanish Trail Segments and Analysis Units

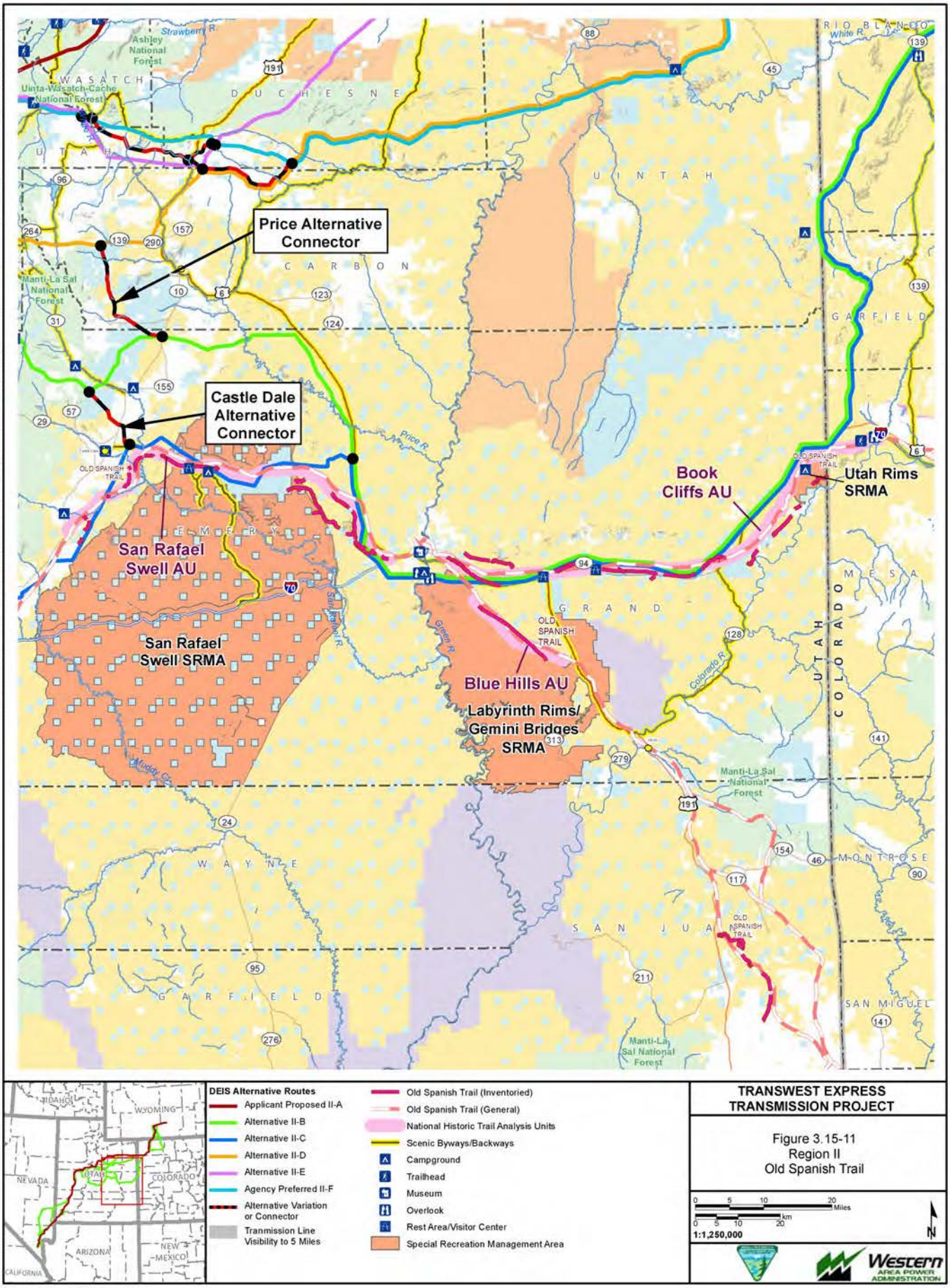
Within the Region II analysis area, the Old Spanish NHT follows a portion of the Colorado River west of the community of Fruita in Mesa County, Colorado; it continues west into Grand County, Utah (BLM Moab FO) along a highway corridor (U.S. Route 6/US 50/I-70) just below the Book Cliffs mountain range. Thereafter, the trail turns north-northwest through the San Rafael Desert and reaches its northernmost point in the northern half of the San Rafael Swell in Emery County (BLM Price FO). The Old Spanish NHT main route continues in a generally southwestern direction across Utah, along the Highway 89 corridor until the town of Junction, Utah, at which point the trail enters Region III, crossing the mountains separating Highway 89 from the I-15 corridor at Cedar City (Iron County). Both the BLM Moab and Price FOs have included direction for Old Spanish NHT management within their 2008 RMPs. However, these RMPs do not address compliance with the recently released BLM National Trails Manuals series and have not defined a National Trail Management Corridor. The Moab RMP indicates that it will consider plan amendment, as necessary, to incorporate provisions of the forthcoming Old Spanish NHT CMP.

The Region II analysis area includes the three AUs inventoried as part of the 2012 NHT Inventory: Book Cliffs, Blue Hills, and the San Rafael Swell AUs. **Figure 3.15-11** identifies the location of each AU corridor, including associated historic sites and key recreation and natural features, as related to the alternatives within the analysis area.

The Book Cliffs AU (Moab FO) contains portions of the Old Spanish NHT northern route and generally is located along I-70 from the Colorado border to the Green River area. There are 62 miles of inventoried trail within the AU; approximately 11 miles are NHT-II and rated as Exceptional. The remaining 51 miles of trail are primarily considered to be High Potential. Condition Category II segments occur in the east and west portions of the AU (AECOM 2012).

The eastern portion of the Book Cliffs AU is located slightly south of and generally parallel to I-70. The Old Spanish NHT route is evident through this area as a two-track road or a long swale. Integrity of historic setting is retained, and scenic quality is average (Class B, with an SQRU score of14), resulting in an overall setting rating of SI (AECOM 2012). The easternmost portion is partially located within the Utah Rims SRMA. The SRMA focuses on motorized, mechanized, and non-motorized route for the rapidly growing Grand Junction area and contains several camping areas. The portion of Highway 70 east of Highway 128 is part of the Dinosaur Diamond Prehistoric Byway.

The central portion of the Book Cliffs AU primarily is located along I-70. The OST trail route exists as a section of old highway or a barely evident grass swale. Trail segments in this area have diminished historic setting and low scenic quality (Class C, with SQRU scores of around 10) where it is adjacent to I-70 and railroad features, resulting in an overall rating of SIII (AECOM 2012). This portion of I-70 is not a part of the



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Dinosaur Diamond Prehistoric Byway. There is one rest stop along this portion of the highway at Thompson Springs (milepost 189). The rest stop offers brochures and maps and provides access for hiking and to nearby Native American rock art at Sego Canyon.

The western portion of the Book Cliffs AU is located along I-70 west of Highway 191. The trail route is marked, variously, as a section of old highway, a single-track path, or a barely evident grass swale. At least one inscription from 1837 occurs within this segment. Integrity of historic setting is retained in the west sections of this AU (especially along the northern portion), and scenic quality is average (Class B, with an SQRU score of 11.5), resulting in an overall rating of SI in the northern segment (AECOM 2012). This portion of I-70 adjacent to the trail is part of the Dinosaur Diamond Prehistoric Byway. The Crescent Junction rest stop (located at milepost 181, at the turnoff to Highway 191) offers a view of the Cisco Desert and Bookcliffs, but has no interpretive sites. The Moab FO RMP includes a management decision to acquire public access to the site of the Old Spanish NHT ford of the Green River, upstream from the town of Green River, Utah, for the purpose of developing an interpretive site. To date, there is no interpretive site located in this area; however, the John Wesley Powell museum is located in the Town of Green River, adjacent to the modern river crossing, and offers historical interpretation displays and other visitor information.

The Blue Hills AU (Moab FO) contains portions of the Old Spanish NHT main route and generally is located south of the Green River, where the Old Spanish NHT main route joins the northern route. In places, the Old Spanish Trail route is visible as wagon ruts or a narrow swale; in other places, any trace of the trail has been obscured by a bladed road. Integrity of historic setting is retained throughout this AU with only a few intrusions, and scenic quality is average (Class B, with an SQRU score of11.5) over most of the AU, resulting in an overall rating of SI. There are13 miles of inventoried trail within the AU; approximately 3 miles are NHT-II and rated as Exceptional. An additional 0.5 mile of trail is rated as Notable. The remaining 10 miles of inventoried trail is considered to be High Potential. The northern portion of this AU is located within the Labyrinth Rims/Gemini Bridges SRMA. The portion of the SRMA nearest this AU is mostly managed for river recreation, and there are no developed camping areas located near the trail segment. Highway 191 (which is a portion of the Dinosaur Diamond Prehistoric Byway) is located to east of the trail segments. A small airport is located at the south end of the AU.

The San Rafael Swell AU (Price FO) includes portions of the Old Spanish NHT northern route and generally is located between Green River and Castle Dale, Utah. There are 58 miles of inventoried trail within the AU; approximately 15 miles are NHT-II and rated as Notable. The remaining 43 miles of trail are considered to be High Potential.

Trail segments are generally located west of Highway 6 just north of the turnoff from I-70 and the Town of Green River (Lost Springs Wash/Trail Springs Wash and Green River Crossing-Cottonwood Wash to Big Flat trail segments), and within portions the San Rafael Swell between Little Cedar Mountain recreation area and Castle Dale, Utah (the Big Flat to Walker Flat trail segments). The trail route is marked, variably, by a two-track, bladed gravel roads, and swales. Integrity of historic setting varies along this AU. Overall, historic setting is retained, but somewhat diminished. Scenic quality primarily is low (Class C, with SQRU scores of 6.5 and 7) within the AU, with the exception of the Green River Crossing to Big Flat segments, which are rated as average (Class B with an SQRU scores of 15.5 and 11.5). The overall rating of San Rafael Swell AU is SIII (AECOM 2012).

The Lost Springs Wash/Trail Springs Wash Segment is managed to preserve the historic character of the landscape, while providing for recreation opportunities and other resources values (BLM 2008). The area provides motorized recreation (limited to designated route), is VRM III, and is a ROW avoidance area except where the designated utility corridor crosses the trail. There are no identified historic or interpretive sites within this area.

The Green River Crossing (via Cottonwood Wash) to Big Flat segment is managed to preserve the historic character of the landscape while providing for recreation opportunities and other resources values (BLM 2008). The area provides motorized recreation (limited to designated routes), contains VRM I, II, and

III areas, and allows ROWs only in the designated utility corridor. There are two areas within this segment that were important watering places and appear to have been used extensively for camping (Big Hole and Little Hole). There also is one potential historic site in this area, the possible Gunnison Expedition camp (AECOM 2012).

The Big Flat to Walker Flat segment and portions of the Green River Crossing to Big Flat segment largely parallel County Road 401 (also known as the Green River cutoff). There is interpretive signage in several locations along County Road 401. The trail segments nearest to Little Cedar Mountain are located on state lands and are not included in the 2012 NHT Inventory. For the purposes of this analysis, it was assumed that the quality of these trail segments is similar to the rest of Big Flat to Walker Flat, and that these segments also would be rated as High Potential. The Big Flat to Walker Flat segment is managed for motorized recreation uses, and there are several recreational areas near the trail, most notably the Wedge Overlook/Buckhorn Drive Scenic Backway. There is a visitor center at the junction of Wedge Road and County Road 401. The area contains VRM I, II, and II areas and allows ROWs only in the designated utility corridor. The portion of the AU within the San Rafael Swell also is part of the San Rafael Swell SRMA. The SRMA is managed to provide motorized and recreational opportunities and contains numerous hiking and OHV trails, largely located to the south of the Old Spanish Trail segments. There are no identified historic or interpretive sites within this area; however, the Museum of San Rafael in Castle Dale, Utah, contains displays of Old Spanish NHT artifacts.

Portions of the Fishlake National Forest located southwest of the San Rafael Swell AU also contain segments of the Old Spanish Trail. The 2012 NHT Inventory did not inventory trail segments on non–BLM lands, thus there is no information regarding the Scenic Class, historic integrity, or resulting overall setting rating for these trail segments. BLM lands directly to the west of the NFS lands are Class C with an SQRU score of 9.5.

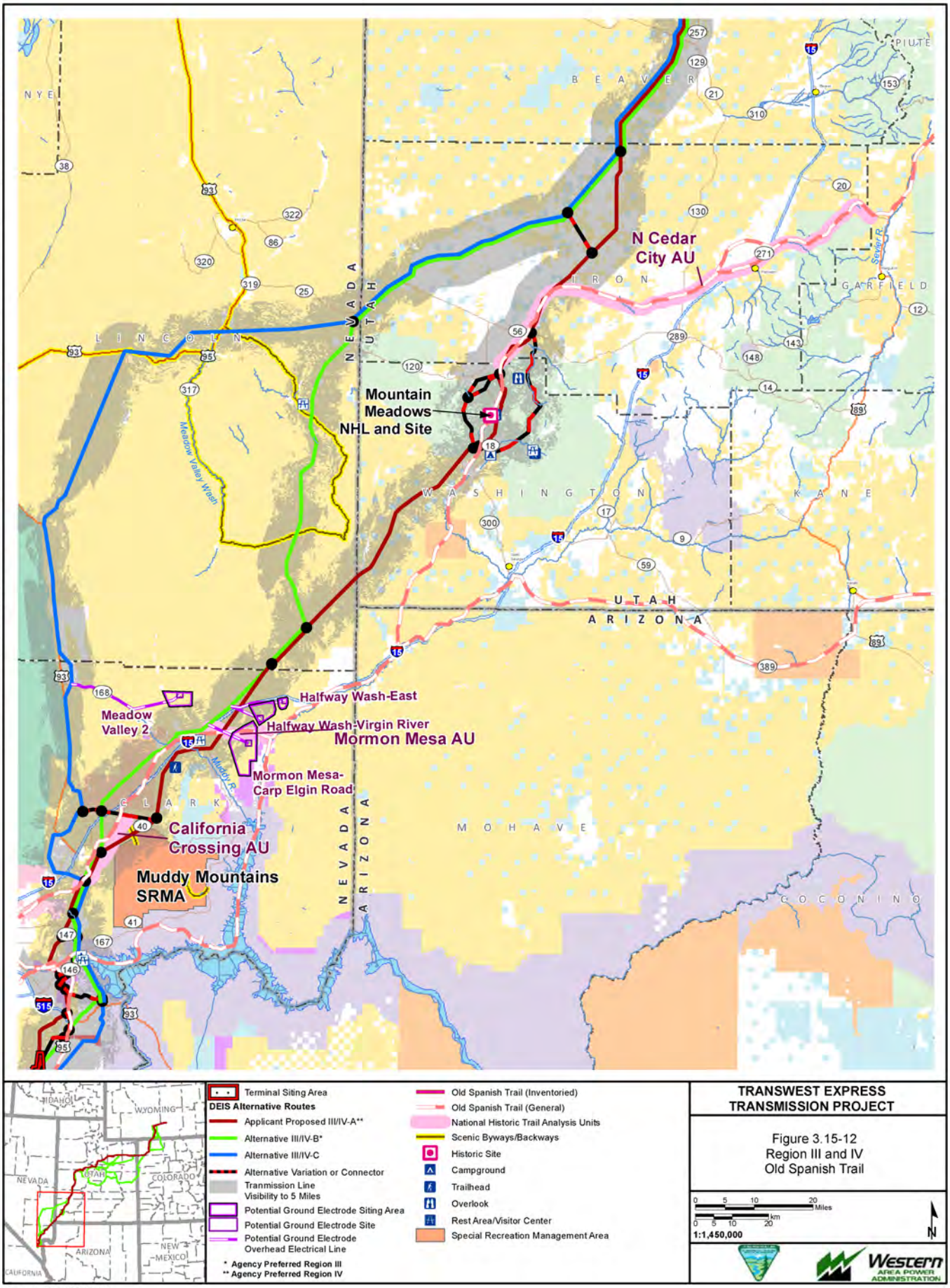
Region III Analysis Area Old Spanish Trail Segments and Analysis Units

Within the Region III analysis area, the Old Spanish NHT continues west of Cedar City in Iron County, Utah (Cedar City FO), then turns south through the Dixie National Forest, and continues west and then south to the Mormon Mesa area near the Utah-Nevada border (St. George and Caliente FOs), rejoining I-15 and generally paralleling the highway corridor to Las Vegas in Clark County, Nevada (Las Vegas FO).

The St. George, Caliente, Cedar City, and Las Vegas FOs do not address the Old Spanish NHT or compliance with the BLM National Trails Manuals series in their RMPs and have not defined a National Trail Management Corridor. The Dixie National Forest LRMP provides some protection of the trail through management areas but does not address the Old Spanish NHT in its LRMP with regard to a defined National Trail Management Corridor or Management Plan.

The Region III analysis area includes three of the AUs inventoried as part of the 2012 NHT Inventory: N. Cedar City, Mormon Mesa, and California Crossing. **Figure 3.15-12** identifies the location of these AU corridors within the analysis area, including historic sites and key recreation and natural features as related to the alternatives and ground electrode areas within the analysis area. The general location of trail segments within the Dixie National Forest also is depicted on **Figure 3.15-12**.

The N Cedar City AU (Cedar City FO) includes portions of the Old Spanish NHT northern route. The AU generally is located northwest of Cedar City and directly north of Dixie National Forest. No NHT Condition Category is available for this AU because it is primarily located on private lands and the portion that is on BLM lands was not included in the 2012 National Historic Trails Inventory Report. The scenic quality in the portion of this AU within the analysis area is primarily Class C (SQRU score of 8.5), with a small portion of the trail within Class B (SRCU score of 13.5) on the eastern side of the AU. There are no associated historic sites, interpretive sites, or recreation areas located near these segments. Within the Dixie National Forest, the Old Spanish Trail generally parallels Mogotsu Creek north and west of Central, Utah. The Mountain Meadows NHL and Site, an associated historic site, is located along the trail. Highway 18, which



TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.15-12
Region III and IV
Old Spanish Trail

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generally parallels the trail, is a popular route for motorized recreation. Trail segments within the Dixie National Forest (of which approximately 15 miles are in the analysis area, were not evaluated in the 2012 National Historic Trails Inventory Report for NHT Condition Category or composite setting ratings.

The Mormon Mesa AU (Las Vegas FO) includes portions of the Old Spanish NHT main route. The AU generally is located between I-15 and the Virgin River, near Logandale, Nevada. There are 12 miles of inventoried trail segments within the AU; approximately 8 miles are NHT-I and II and occur as a nearly continuous trail trace. These segments are rated as Exceptional. The remaining 4 miles are rated as Evident. Within the Mormon Mesa AU, the trail route can be seen but is utilized by OHVs in some locations. Remnants of stone retaining walls occur in segment where the trail traverses the escarpment between Mormon Mesa and the Virgin River floodplain. The Meadow Valley Wash and the Muddy River are located near the AU. Integrity of historic setting is retained throughout this AU, and scenic quality over most of the AU is average (Class B, with an SQRU score of 15) except for the easternmost area along the Virgin River, which has high scenic quality (Class A, with a SQRU score of 21), resulting in an overall rating of SI (AECOM 2012).There are no interpretive signs or recreation areas, but there is a rest stop located on the side of the highway opposite the trail segment. There are no associated historic sites located near these segments.

The California Crossing AU (Las Vegas FO) includes portions of the Old Spanish Trail main route. The AU is located about 20 miles northeast of Las Vegas, east of I-15, near the intersection of I-15 and Highway 93 (the Great Basin Highway). There are 3 miles of inventoried trail within the AU; approximately 1 mile is NHT II and rated as Exceptional. The remaining 2 miles are rated as High Potential. At most locations within the inventoried 3-mile segment, no specific trail location or trace could be identified. One segment with well-sorted gravels and two faint ruts was identified. Integrity of historic setting is retained with only a few minimal intrusions. Scenic quality is low (Class C, with a SQRU score of 8.5), resulting in an overall rating of SII (AECOM 2012). There are no associated historic sites, interpretive sites, or recreation areas located near these segments.

3.15.3.8 Designated National Historic Landmarks and Districts

There is one NHL within the analysis area, the Mountain Meadows NHL and Site in Washington County in southwestern Utah. This NHL marks where 120 emigrants, most of them from Arkansas, were massacred by Mormon militiamen. The landmark and district is managed by the USFS and comprises as a discontiguous district made up of two parcels, capturing two known locations of the events that occurred from September 7 through 11, 1857, and later burial, commemoration, and memorialization efforts that continue to the present. The two parcels comprise approximately 760 acres of the existing approximately 3,000-acre NRHP historic district, which was listed in 1975. Impacts to the Mountain Meadows NHL and Site historic landmark and district are discussed in detail in Section 3.11, Cultural Resources; Section 3.12, Visual Resources; and Section 3.13, Recreation.

3.15.3.9 Designated Roadless Areas and Unroaded/Undeveloped Areas

<u>Inventoried Roadless Areas</u>

IRAs are identified as areas of NFS land currently inventoried for planning purposes as roadless. The 2001 Roadless Area Conservation Rule prohibits road construction, road reconstruction, and timber harvesting on IRAs on NFS lands. IRAs were designated primarily to preserve existing quality habitat sustained and supported by the absence of fragmentation from roads construction and mining or timber harvesting activities. Criteria for IRA designation are size (5,000 acres or more OR the area must be contiguous to existing wilderness, primitive areas, or potential wilderness; a self-contained ecosystem [such as an island]; or have physical terrain or natural conditions that would allow preservation) and lack of permanently authorized roads.

In addition, the Roadless Rule contains nine attributes that contribute to roadless area evaluation:

- High quality or undisturbed soil, water, and air;
- Sources of public drinking water;
- Diversity of plant and animal communities;
- Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land;
- Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized classes of dispersed recreation that provide recreation opportunities in areas with wilderness-like attributes but allow mechanized travel;
- Reference landscapes of relatively undisturbed areas that serve as a barometer to measure the effect of development on other parts of the landscape;
- Natural appearing landscapes with high scenic quality;
- Traditional cultural properties and sacred sites; and
- Other locally identified unique characteristics, such as, uncommon geological formations, unique wetland complexes, or social, cultural, or historical characteristics.

Wilderness attributes may also be affected by land-disturbing activities that occur in IRAs. The specific categories of wilderness quality that are considered for impacts include:

- Untrammeled (Is the land unhindered and free from modern human control or manipulation?).
- Natural (Are the land's ecological systems substantially free from the effects of modern civilization?).
- Undeveloped (Is the land essentially without permanent improvements or modern human occupation?).
- Outstanding opportunities for solitude or primitive/unconfined recreation (Can the land provide a solitary and natural recreation experience?).
- Special features (Does the land possess special ecological, geologic, scenic, or other significance?).
- Manageability (Can the land be managed to meet the wilderness size criteria of 5,000 acres?).

The Roadless Rule does not prohibit special use developments, but generally does prohibit the construction or reconstruction of any roads associated with these uses within the boundaries of an IRA.

Unroaded/Undeveloped Areas

Pursuant to prior NFMA implementing regulations at 36 CFR 219.17 (as published in 36 CFR 200 to 299 [July 1, 2000 edition]), and using inventory procedures found in the Forest Service Handbook 1909.12, Chapter 71, the national forests each created an inventory of draft URUD areas. These were formally initiated with NOIs in 2002 (Federal Register 11 67[90]:31178 and 67[91]:31761, respectively), with the purpose of identifying potential wilderness areas in the NFS during upcoming LRMP revision efforts. The Uinta National Forest, which completed its LRMP in 2003, has already evaluated draft URUD lands into LRMP management direction. For those national forests that did not complete their LRMP revisions (Fishlake, Dixie, Manti-La Sal, and Ashley national forests), this information represents the latest inventory data for areas with potential wilderness qualities or attributes. The 2005 draft inventories of URUD areas were based on direction in the Intermountain Region Planning Desk Guide: A Protocol for Identifying and Evaluating Areas for Potential Wilderness (USFS 2004). Wilderness attributes to be considered in the analysis of impacts to URUD areas are the same six attributes described under IRAs, above. However,

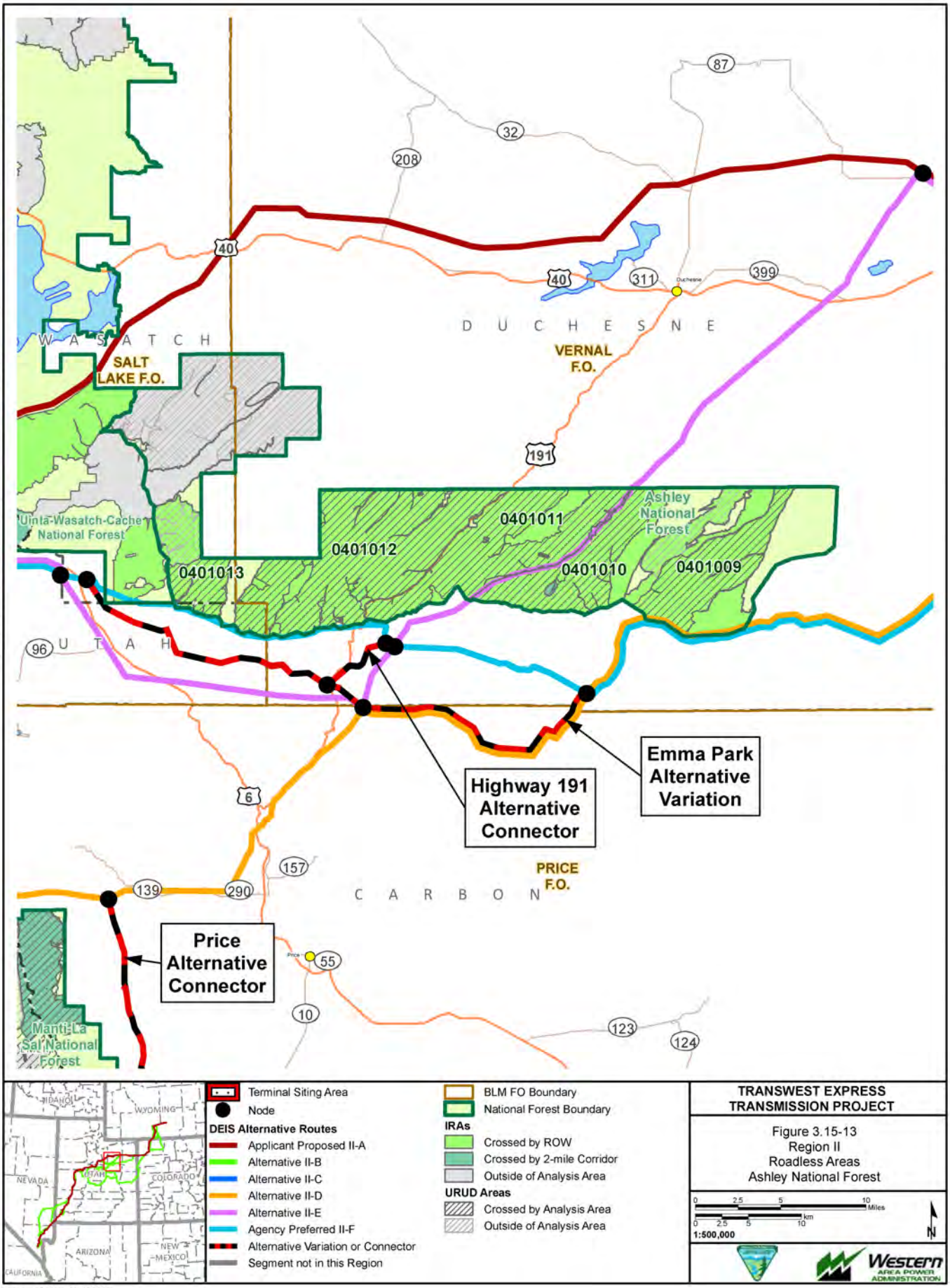
there is no policy, law, or directive guiding the management of identified draft URUD areas that lie outside of IRAs or wilderness areas; the only guidance for these areas is general forest or management area direction in the current LRMPs.

There are 31 IRAs and 26 URUD areas within the analysis area. These areas are listed in **Table 3.15-5** and shown on **Figures 3.15-13** through **3.15-16**. As shown on the figures, IRAs and URUD areas overlap considerably, but not entirely. **Appendix H** contains supporting information regarding the nine IRA natural resources attributes and the six wilderness attributes that apply to both IRAs and URUD areas.

Table 3.15-4 IRA/Unroaded-Undeveloped Areas in Analysis Area

National Forest	IRA/Unroaded-Undeveloped (URUD) Area	Acres IRA/URUD
Ashley (Region II)	IRA#401009/Alkali Canyon URUD	30,356/16,885
	IRA #0401010/Sowers Canyon East URUD	21,869/17,028
	IRA #0401011/Cottonwood Canyon URUD	30,039/25,989
	IRA #401012/First Canyon URUD/Right Fork Indian Canyon URUD	46,312/37,447/6,725
	IRA #401013/Mill Hollow Road URUD	11,892/6,128
Fishlake (Region II)	Browns Hole URUD	8,212
	Moroni Peak URUD	10,890
	Mount Terrill URUD	30,035
	North Pavant IRA/URUD	53,232/64180
	Oak Creek IRA/URUD	16,755/78,296
	Oak Ridge URUD	12,478
	The Rocks URUD	6,266
Manti-La Sal (Region II)	Boulger-Black Canyon IRA/URUD	23,266/24,430
	Cedar Knoll IRA/URUD	22,483/28,349
	Coal Hollow IRA/URUD	6,264/7,094
	East Mountain IRA/URUD	30,680/28,302
	Nuck Woodward IRA/Nuck Woodward-Gentry Mountain URUD	12,071/24,567
	Oak Creek IRA/URUD	16,755/5,349
	Sanpitch IRA/URUD	29,107/21,680
Uinta[1] (Region II)	IRA #418008/Chipman Creek	9,359
	IRA #418009/Willow Creek	18,049
	IRA #418015/Strawberry Ridge	17,274
	IRA #418016/Diamond Fork	35,210
	IRA #418017/Tie Fork	19,615
	IRA #418019/Soldier Summit	6,850
	IRA #418021/Hop Creek Ridge	6,250
	IRA #418028/Golden Ridge	33,976
	IRA #418029/Nephi	15,661
Dixie (Region II)	Atchinson IRA/URUD	17,663/24,306
	Bull Valley IRA/URUD	10,919/13,372
	Cove Mountain IRA/URUD	16,639/15,678
	Gum Hill IRA	3,182
	Kane Mountain IRA/URUD	8,016/9,635
	Moody Wash IRA/ Mogotsu IRA/ Moody Wash/Mogotsu URUD	31,857/16,771/58,994
	Pine Valley Mountain IRA/URUD	57,691/154,419

[1] Only lands within the Uinta National Forest portion of the Uinta-Wasatch-Cache National Forest are within the analysis area.



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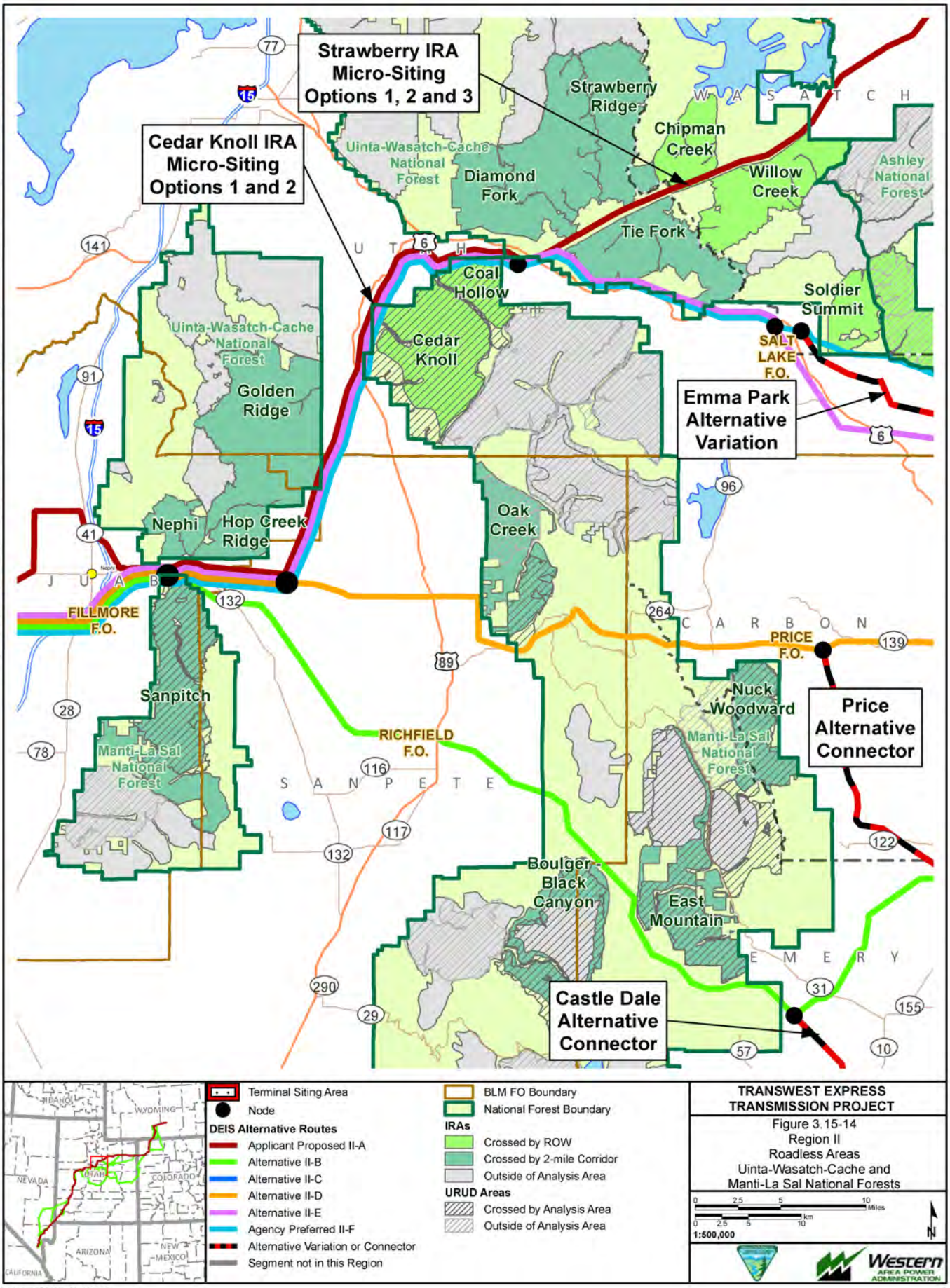
Strawberry IRA Micro-Siting Options 1, 2 and 3
Cedar Knoll IRA Micro-Siting Options 1 and 2
Emma Park Alternative Variation
Price Alternative Connector
Castle Dale Alternative Connector
Strawberry Ridge
Chipman Creek
Willow Creek
Ashley National Forest
Uinta-Wasatch-Cache National Forest
Diamond Fork
Tie Fork
Coal Hollow
Soldier Summit
SALT LAKE F.O.
Cedar Knoll
Golden Ridge
Nephi
Hop Creek Ridge
Oak Creek
FILLMORE F.O.
PRICE F.O.
Sanpitch
Manti-La Sal National Forest
RICHFIELD F.O.
Nuck Woodward
Boulger - Black Canyon
East Mountain
W A S A T C H
U T A H
J U A B
C A R B O N
S A N P E T E
E M E R Y
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
BLM FO Boundary
National Forest Boundary
IRAs
Crossed by ROW
Crossed by 2-mile Corridor
Outside of Analysis Area
URUD Areas
Crossed by Analysis Area
Outside of Analysis Area
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.15-14
Region II
Roadless Areas
Uinta-Wasatch-Cache and
Manti-La Sal National Forests
1:500,000
Western AREA POWER ADMINISTRATION
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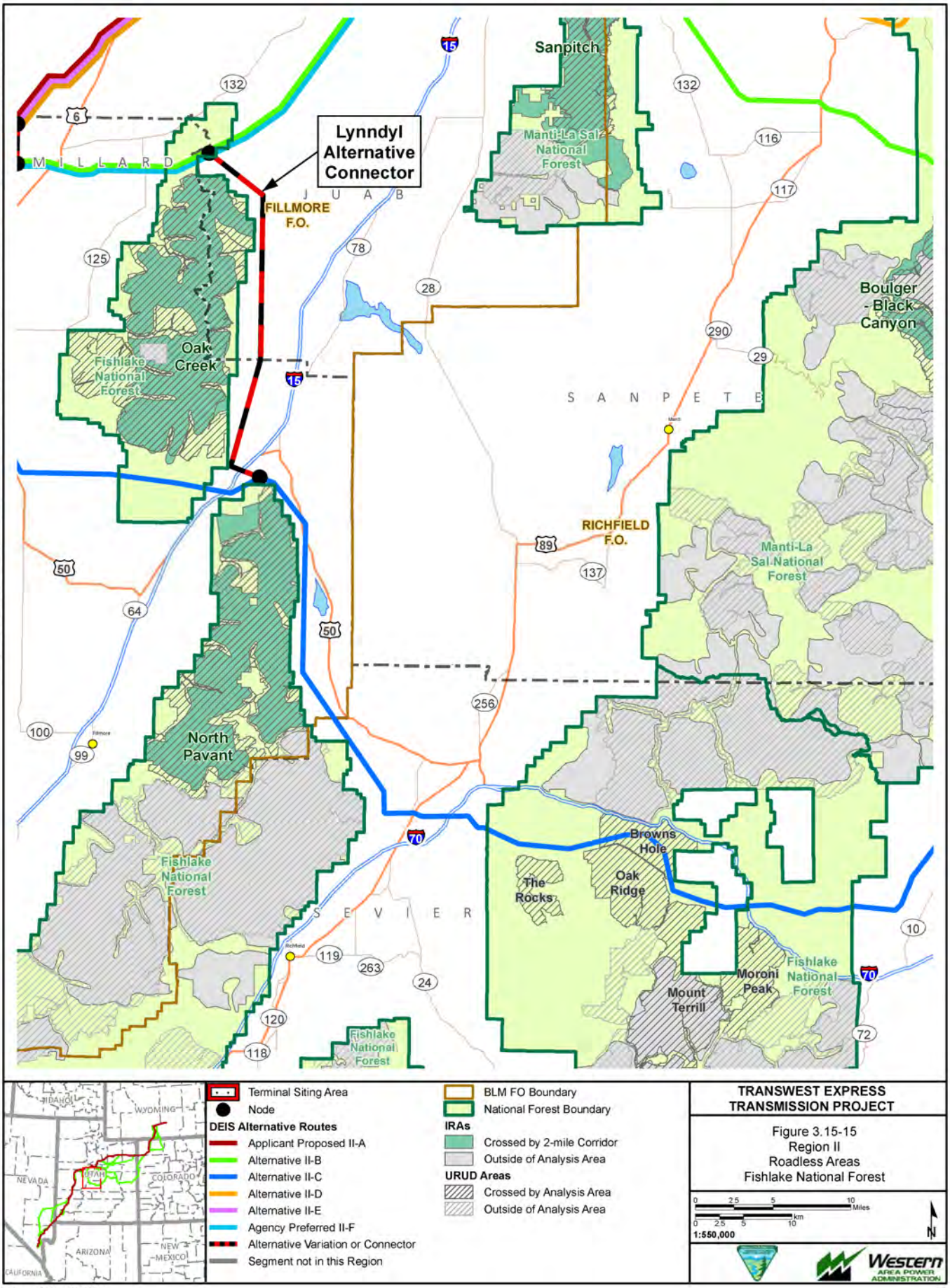

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.15-15
Region II
Roadless Areas
Fishlake National Forest

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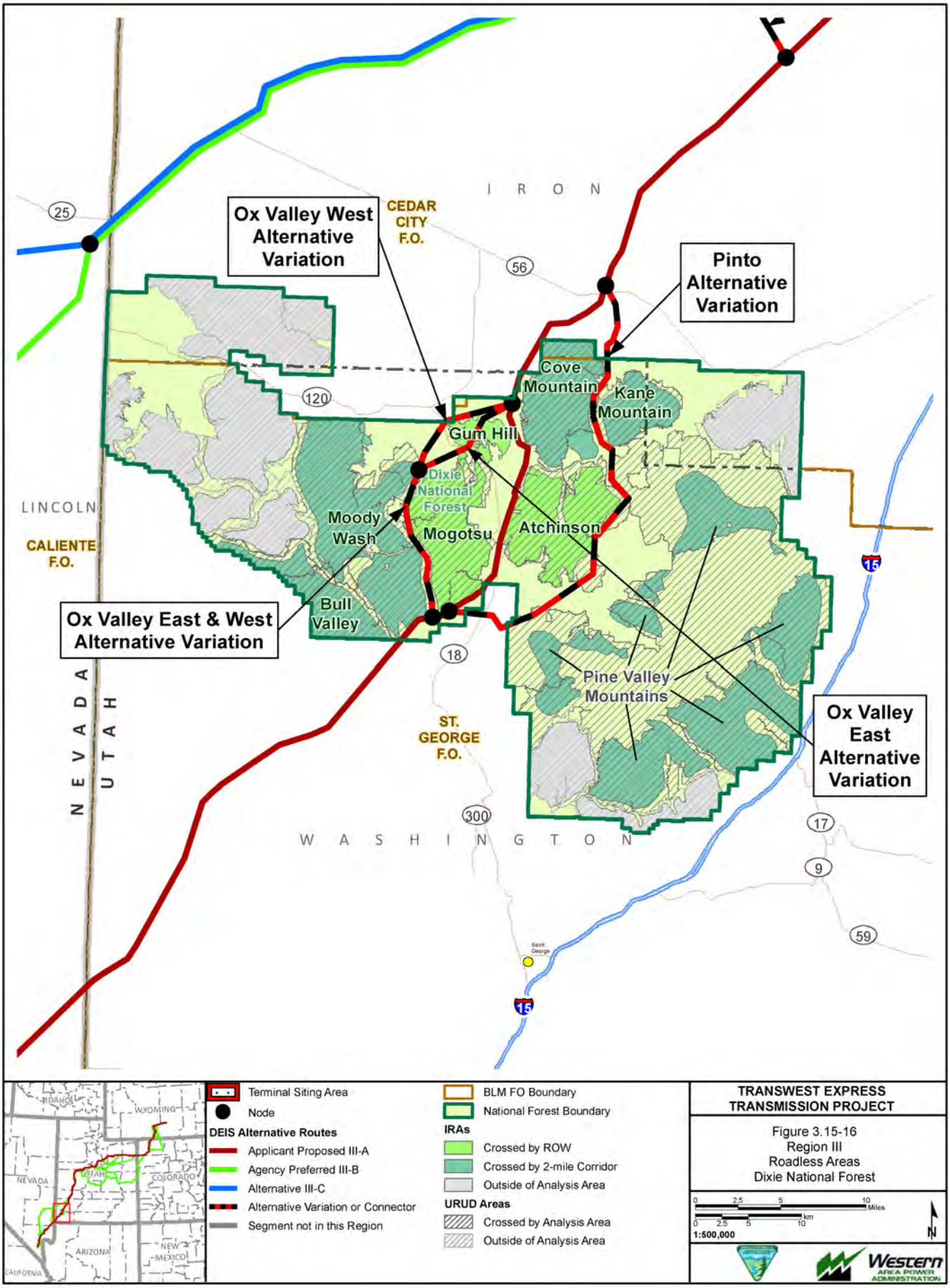
Ox Valley West Alternative Variation
CEDAR CITY F.O.
I R O N
Pinto Alternative Variation
Cove Mountain
Kane Mountain
Gum Hill
Dixie National Forest
Moody Wash
Mogotsu
Atchinson
LINCOLN
CALIENTE F.O.
Bull Valley
Ox Valley East & West Alternative Variation
Pine Valley Mountains
Ox Valley East Alternative Variation
ST. GEORGE F.O.
N E V A D A
U T A H
W A S H I N G T O N
25
56
120
18
300
17
9
59
15
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
BLM FO Boundary
National Forest Boundary
IRAs
Crossed by ROW
Crossed by 2-mile Corridor
Outside of Analysis Area
URUD Areas
Crossed by Analysis Area
Outside of Analysis Area
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.15-16
Region III
Roadless Areas
Dixie National Forest
1:500,000
Western AREA POWER ADMINISTRATION
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3.15.3.10 Areas of Critical Environmental Concern

ACECs are an administrative designation made by the BLM through a land use plan. FLPMA defines an ACEC as an area "within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards."

To be designated as an ACEC, the area must meet the criteria of relevance and importance (as defined in BLM Manual 1613). An area meets the relevance criteria if it contains one or more of the following:

- A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).
- A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species, or habitat essential for maintaining species diversity).
- A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).
- Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the RMP process that it has become part of a natural process.

The value, resource, system, process, or hazard described in the relevance section must have substantial significance and values to meet the importance criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

- Has qualities that are more than locally significant, giving it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.
- Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.
- Is recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.
- Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.
- Poses a significant threat to human life and safety or to property.

Private lands and lands administered by other agencies may be located within the boundaries of ACECs, but are not subject to the prescribed management of the ACEC.

Sixteen ACECs have been designated on BLM lands located within the analysis area. The applicable RMPs for each BLM FO identify the specific conditions and/or restrictions imposed within each of the ACECs. The ACECs located within the analysis area are tabulated in **Table 3.15-5** and shown on **Figures 3.15-1** through **3.15-4**.

3.15.3.11 Other Special Designation Areas

<u>Special Management Areas</u>

Other areas of special management have been designated because they contain strong characteristics of specific resources considered in special designation, but a determination by the agency has not been made or has been deferred.

The Monument Valley Special Management Area consists of 69,940 acres of BLM-administered lands in the Rock Springs FO with unique scenic features and the high potential for significant cultural and paleontological resources. It is managed to provide protection to wildlife, geologic, cultural, watershed, scenic, and scientific values. BLM has deferred designating this area an ACEC until additional cultural and paleontological surveys are completed to aide in the agencies' management determination.

State Wildlife Management Areas

The analysis area contains Wyoming WHMAs, Colorado state wildlife areas (SWA), hunting leases, and Utah WMAs. These WMAs have been established to preserve fish and wildlife habitat and to provide recreational opportunities including fishing, hunting, and wildlife viewing. Impacts to these areas are discussed in detail in Section 3.13, Recreation Resources.

Table 3.15-5 Areas of Critical Environmental Concern within the Analysis Area

BLM FO	ACEC	Relevance and Importance Values and Management Prescriptions[1]
Region I		
There are no ACECs in the analysis area.		
Region II		
White River FO, Colorado	Oil Spring Mountain WSA/ACEC (18,260 acres)	Designated for spruce-fir and biologically diverse plant communities, BLM sensitive species, and remnant vegetation associations. WSA is a ROW exclusion area but not recommended to be carried forward as wilderness. The proposed ACEC would be managed as a ROW avoidance area.
	White River Riparian ACEC (950 acres)	Designated for important biologically diverse plant communities, bald eagle roosts, Federally listed Colorado River squawfish below Taylor Draw Dam. ROW avoidance area; surface disturbance contingent upon avoidance of cottonwood communities, maintenance of utility as bald eagle habitat and properly functioning riparian community, and use of special reclamation techniques to accelerate recovery and reestablishment of habitat.
Grand Junction FO, Colorado	Badger Wash ACEC (1,520 acres)	Designated for sensitive plants; is a 680-acre hydrologic research area designed to study the effects of surface-disturbing activities on sediment yield; is designated as unsuitable for public utilities.
Vernal FO, Utah[2]	Lears Canyon ACEC (1,375 acres)	Contains a natural system, specifically relict plant and Douglas fir-pinyon-juniper vegetation communities, serves as a scientific reference area. NSO for oil and gas development (ROW avoidance area); closed to motorized travel; managed as VRM II.
	Nine Mile Canyon ACEC (44,168 acres)	Nationally significant Fremont, Ute, archaic rock art and structures, and special status plant habitat. Managed as NSO for oil and gas development (ROW avoidance area); managed as VRM II within the canyon.
	Lower Green River Corridor ACEC (8,470 acres)	Significant riparian habitat and outstanding (Class A) scenic values; provides critical habitat for 4 special status fish species and 11 special status species. The lower segment of the Green River has scenic qualities and undeveloped natural areas producing high quality recreation opportunities, as well as rare and fragile archaeological sites.
Price FO, Utah	Rock Art ACEC (contains 13 units, 5,300 acres total)	Some of the best examples of prehistoric rock art in the Colorado Plateau. ROW exclusion area; NSO for oil and gas development; excluded from land treatments and range improvements except for watershed control structures to protect cultural resource values; OHV limited to designated roads and trails.
	San Rafael Canyon ACEC (15,200 acres)	Designated for scenic values. The San Rafael River has cut a channel creating what is known as the "Little Grand Canyon" as viewed from the Wedge. The Black Boxes are world renowned. ROW avoidance area; NSO for oil and gas; VRM II; excluded from land treatments and range improvements unless used to protect or improve riparian values; OHV limited to designated roads and trails.

Table 3.15-5 Areas of Critical Environmental Concern within the Analysis Area

BLM FO	ACEC	Relevance and Importance Values and Management Prescriptions[1]
Region III		
St. George FO, Utah	Beaver Dam Slope ACEC (48,519 acres)	Designated for desert tortoise habitat; also contains habitat for a diversity of desert plant and animal species, many of which are listed by state or federal agencies as special status species. Included in the area are the Joshua Tree National Natural Landmark and the Woodbury Desert Study Area. The study area has been the focus of desert wildlife and ecosystem research since the 1930s. Values within the ACEC are at risk from increasing levels of human encroachment, off-road travel, and various forms of outdoor recreation. The area is designated as a ROW avoidance area except in designated utility and transportation corridors.
Caliente FO, Nevada	Beaver Dam Slope ACEC (36,800 acres)	Critical desert tortoise habitat; managed primarily for recovery of the species including such actions as closure or major restrictions on mineral development, removal of livestock grazing, limited OHV use to designated roads and trails, limiting authorization of new ROWs, limitation of fire management activities, and prohibition of land disposals. Contains sensitive plan species populations.
	Kane Springs ACEC (57,190 acres)	Critical desert tortoise habitat; managed primarily for recovery of the species, including such actions as closure or major restrictions on mineral development, removal of livestock grazing, limited OHV use to designated roads and trails, limitation of fire management activities, and prohibition of land disposals. ROW limited to use of existing corridors. Contains sensitive plant species populations.
	Mormon Mesa – Ely ACEC (109,680 acres within CFO)	Designated for critical desert tortoise habitat; also contains sensitive plant species populations. Management prescriptions include such actions as closure or major restrictions on mineral development, removal of livestock grazing, limitation on OHV use to designated roads and trails, limitation of fire management activities, and prohibition of land disposals. ROW limited to use of existing corridors and the ACEC contains both ROW avoidance and exclusion areas.
Las Vegas FO, Nevada	Mormon Mesa ACEC (151,360 acres within LVFO)	Designated for critical desert tortoise habitat. Management as ROW avoidance area except within existing corridors; requires reclamation of temporary roads. OHV use is limited to designated roads and trails.
	Coyote Springs Valley ACEC (75,500 acres)	Designated for critical desert tortoise habitat. ROW avoidance area except within corridors. Closed to locatable minerals and solid leasables, livestock grazing, and commercial collection of flora. OHV use is limited to designated roads and trails.
Region IV		
Las Vegas FO, Nevada	Rainbow Gardens ACEC (37, 620 acres)	Geological, scientific, scenic, and sensitive plant values throughout the ACEC; cultural values on 320 acres. The ACEC contains sensitive soil "badland" areas as well as the Great Unconformity, a location where there are missing intervals of the geologic record. In ROW avoidance area except within corridors; reclamation of temporary roads is required. OHV use limited to designated roads and trails.
	River Mountains ACEC (5,617 acres)	Bighorn sheep habitat; scenic viewshed for Henderson and Boulder City. ROW avoidance area except within corridors; reclamation of temporary roads is required. OHV use is limited to existing roads and trails.

[1] BLM VRM classes are described in more detail in Section 3.12, Visual Resources.

[2] Per the 2008 RMP, within the Vernal FO, ROWs exclusion and avoidance areas are consistent with areas closed to oil and gas leasing or with a NSO stipulation, respectively.

Sources: BLM 2008a,b,c,d; 1997a,b.

National and State Recreation Areas

Congressionally designated NRAs, BLM recreation use areas, and SRMAs are located within the analysis area. These recreation areas have been established to provide recreational opportunities including OHV uses, boating, and various types of non-motorized recreation. Impacts to these recreation areas are discussed in detail in Section 3.13, Recreation Resources.

3.15.4 Impacts to Special Designations

This analysis identifies the impacts to SDAs that would occur from the construction, operation, and decommissioning of the proposed Project. The analysis focuses on the alternative transmission line routes within each Project region and associated alternative variations and connectors, the north and south terminal areas, and ancillary facilities described in detail in Sections 2.4 and 2.5 and **Appendix D**.

For impacts from the Northern and Southern terminals, the analysis considers a 1-mile area surrounding the terminal footprint. For transmission line impacts, the analysis considers a 250-foot-wide transmission line ROW, centered on the transmission reference line (125 feet on either side of the reference line), in relation to the entire SDA. For impacts from access roads, staging areas, and fly yards, the analysis considers a 2-mile transmission line corridor within which these facilities would be located, in relation to the entire SDA.

Quantification of impacts to SDAs is based upon the following:

- Miles of reference line within an SDA;
- Acres of an SDA within the 250-foot-wide transmission line ROW; and
- Acres of an SDA within the proposed 2-mile transmission line corridor.

The assessment of impacts to SDAs is based on the interests and land management objectives of local and federal landowners and management agencies as well as public concerns as identified through public scoping. Impact assessment generally focuses on conformance with the management objectives for the area and impact to the resource values for which the SDA was designated (for example, the relevant and important values of an ACEC, the roadless characteristics of an IRA, or the wilderness attributes of a wilderness area or URUD area).

3.15.4.1 Impacts from Terminal Construction, Operation, and Decommissioning

This section discloses impacts to land uses that would occur from construction and operation of the Northern and Southern terminals, which are common to all action alternatives.

Northern Terminal

The Northern Terminal site would be on private lands in Carbon County, Wyoming, approximately 2.5 miles southwest of the town of Sinclair, Wyoming. The Northern Terminal facilities would occupy 234 acres of private lands (see **Figure 2-16**).

The Northern Terminal would not disturb any lands within any SDAs. There are no IRAs within the Northern Terminal. There would be no conflicts with state or federally established, designated or reasonably foreseeable planned SDAs because none exist in or near the Northern Terminal.

Southern Terminal

The Southern Terminal facilities would be in the Eldorado Valley approximately 15 miles southwest of Boulder City, in Clark County, Nevada. The Southern Terminal site initially would occupy 415 acres on private lands (see **Figure 2-17**). The Southern Terminal would be located entirely within the Eldorado Valley on lands that have been annexed by Boulder City. The Southern Terminal would not disturb any lands within any SDAs. However, the Southern Terminal is adjacent to the Sloan Canyon NCA. The 48,000-acre NCA is managed to conserve, protect, and enhance the cultural, archaeological, natural, wilderness, scientific, geological, historical, biological, wildlife, educational, and scenic resources of this area. The portion of the NCA closest to the Southern Terminal is managed as a semi-primitive, non-motorized area allowing camping, hiking, and equestrian use and is classified as VRM II. The NCA would not be directly affected by the proposed terminal facilities; however, during construction, the quality of the uses in the area closest to the Southern Terminal could be temporarily reduced from construction noise and activity. Visual impacts during operations would be consistent with existing uses (see Section 3.12, Visual Resources, for a

discussion of visual impacts and mitigation measures). As discussed in the Section 3.14, Land Use, re-siting the Southern Terminal facilities within the Energy Expansion Area would move the Southern Terminal further from the Sloan NCA and Nelson/Eldorado SRMA. Impacts to the Nelson/Eldorado SRMA are discussed in Section 3.13, Recreation Resources. Impacts from decommissioning would be similar those discussed under construction.

Design Options 2 and 3

Under Design Option 2, the Southern Terminal would be located near the IPP in Millard County, Utah instead of at the Marketplace in Nevada. Design Option 2 would have no new or additional effects to SDAs because there are no SDAs within the relocated Southern Terminal. The Marketplace Southern Terminal location would become a substation, with effects similar to those described above.

Under Design Option 3, a substation would be constructed on BLM lands directly adjacent to the IPP within Millard County, Utah. Design Option 3 would have no new or additional effects to SDAs because there are no SDAs within the proposed location for the substation.

3.15.4.2 Impacts Common to All Alternative Routes and Associated Facilities

Impacts to SDAs in the four Project regions may occur during construction, operation, maintenance, and decommissioning of the transmission line and associated temporary and permanent facilities associated with the alternative routes, alternative variations, and alternative connectors. Potential impacts to SDAs from the construction and operation of the Project would depend on the relevant and important values of each SDA; therefore, each SDA is discussed separately in the regional analyses contained in Sections 3.15.4.3 through 3.15.4.6.

At the end of the Project's 50-year ROW grant, or when it is determined that the Project is no longer economical, the Project would be decommissioned and the area reclaimed. Impacts from decommissioning of the Project are expected to be very similar to the effects from construction activities as discussed in the following sections. Upon decommissioning, land use impacts from construction and operation of the Project would generally be reversible with successful vegetation reclamation.

To reduce impacts from the Project on SDAs, TransWest has committed to comply with all agency stipulations (**Appendix C**, **TWE-1**). If BLM stipulations cannot be met, additional mitigation could be required, as discussed in the sections below. Special IRA construction techniques would be employed as described in **Appendix D**, and would not require the establishment of roads within these areas.

Design Options 2 and 3

Under Design Option 2 there would be a series compensation station midway between the IPP and the Eldorado Valley. Exact locations have not been determined, but would be within the 2-mile transmission line corridor and thus included in the alternative analysis contained in the regional analysis below.

Design Option 3 would involve phased construction. Timing of impacts to SDAs would vary due to construction schedule differences but would not appreciably change surface disturbance or impacts to resources for which SDAs were designated. There would be a series compensation station midway between the Rawlins and IPP. Exact locations have not been determined, but would be within the 2-mile transmission line corridor and thus included in the alternative analysis contained in the regional analysis below.

3.15.4.3 Region I

SDAs within Region I are listed in **Table 3.15-6** and are shown on **Figures 3.15-1** and **3.15-5**, The table includes SDAs within the 250-foot-wide transmission line ROW as well as SDAs outside of the 250-foot-wide transmission line ROW but within the 2-mile transmission line corridor.

Table 3.15-6 Region I: SDAs Within 250-foot-wide Transmission Line ROW and 2-Mile Transmission Line Corridor

Managing Entity	SDAs	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
NPS	Dinosaur National Monument	0 acres within 250-foot ROW, 16 acres within 2-mile corridor	0 acres within 250-foot ROW, 16 acres within 2-mile corridor	0 acres within 250-foot ROW, 16 acres within 2-mile corridor	0 acres within 250-foot ROW, 16 acres within 2-mile corridor
NPS	CDNST	1 trail segment crossed	1 trail segment crossed	1 trail segment crossed	1 trail segment crossed
BLM Rawlins FO	CDNST SRMA	0.1 mile/4 acres within 250-foot ROW; 179 acres within 2-mile corridor	0.1 mile/4 acres within 250-foot ROW; 179 acres within 2-mile corridor	0.1 mile/4 acres within 250-foot ROW; 179 acres within 2-mile corridor	0.1 mile/4 acres within 250-foot ROW; 179 acres within 2-mile corridor
Overland Trail					
BLM Rawlins FO	Crossings and segment NRHP eligibility	1 contributing segment crossed	1 contributing segment crossed	1 contributing segment crossed	1 contributing segment crossed
	Visibility of the alternative from the trail [1]	Visible along 9 miles of trail, 5 of which are contributing	Visible along 10 miles of trail, 4 of which are contributing	Visible along 7 miles of trail, 6 of which are contributing	Visible along 9 miles of trail, 4 of which are contributing
	Associated Historic Sites and natural features, and nearby recreation or interpretive features	None	Duck Lake Station, Red Rock	Highway 789 interpretive sign, Washakie Station, Muddy Creek	None
	Management/land use	BLM land, not within designated utility corridor	Private land	Private land	BLM land, not within designated utility corridor
Cherokee Trail					
BLM Rawlins FO	Crossings and segment NRHP eligibility	1 contributing segment crossed	1 contributing segment crossed	1 contributing segment crossed	3 non-contributing segments crossed
	Visibility of the alternative from the trail[1]	Visible along 24 miles of trail, 10 of which are contributing	Visible along 9 miles of trail, 4 of which are contributing	Visible along 11 miles of trail, 4 of which are contributing	Visible along 28 miles of trail, 10 of which are contributing
	Associated Historic Sites and natural features, nearby recreation or interpretive features	None	None	Muddy Creek, Cherokee Creek	None
	Management/land use	BLM land, within designated underground utility corridor	BLM land, within designated underground utility corridor	BLM land, not within a designated utility corridor	BLM land, not within a designated utility corridor

[1] Visibility of the alternative from the historic trails is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed.

Alternative I-A (Applicant Proposed)

BLM SDAs and National Landscape Conservation System Lands

There are no BLM SDAs crossed by the 250-foot-wide transmission line ROW for Alternative I-A.

USFS IRAs and URUD Areas

There are no IRAs or URUD areas crossed by the 250-foot-wide transmission line ROW for Alternative I-A.

Other Federally Managed SDAs and National Trails

Approximately 16 acres of the Deerlodge Park Road, an access road to Dinosaur National Monument lies within the portion of the 2-mile transmission line corridor west of Highway 40; the 250-foot-wide transmission

line ROW would parallel an existing transmission line on the opposite (east) side of Highway 40. During construction, the presence of construction equipment, personnel, or traffic would temporarily reduce the quality of site visitation during construction. Although there are no known Dinosaur National Monument management restrictions associated with the Dinosaur National Monument access road, Project access roads and staging areas also most likely would be located on the east side of Highway 40 (opposite from the Dinosaur National Monument) to reduce travel distances, and to reduce impacts to highway traffic and the Dinosaur National Monument. BLM BMPs also would require consolidation of roads, support areas, and other infrastructure to minimize disturbance and would require reclamation of any roads not needed for operations unless otherwise specified by the managing agency. However, due to the importance of Dinosaur National Monument, the following additional mitigation measures are recommended to further reduce the potential for impacts:

SDA-1*: Within SDAs, access shall be limited to existing roads whenever practicable. ROWs that currently are not sited within SDAs shall not be placed within the SDA during subsequent micro-siting efforts associated with development of the POD.*

SDA-2*: If new or improved access roads cannot be avoided within SDAs, roads shall be closed or rehabilitated through methods developed through consultation with the landowner or land management agency. Methods for closure could include gates, obstructions such as berms or boulders, or partial or full restoration to natural contour or vegetation.*

Application of these mitigation measures would eliminate construction surface disturbance within the Deerlodge Park Road ROW and potential viewshed easement area, thereby reducing direct impacts to Dinosaur National Monument; however, there would still be temporary impacts to quality of site visitation due to the proximity of road and staging area locations. Additionally, during operation, visitors exiting the park via Deerlodge Park Road would see portions of the transmission line across Highway 40 (see Section 3.12, Visual Resources, for visual impacts).

The current proposed route for the 250-foot-wide transmission line ROW for Alternative I-A would cross a conservation easement that prohibits overhead transmission line. Micro-siting adjustments have been developed that would relocate the 250-foot-wide transmission line ROW outside of the easement area and closer to or within national monument lands. These micro-siting adjustments are analyzed under Alternative I-D.

Within the Rawlins FO, the transmission reference line would cross the CDNST and CDNST SRMA, just south of Rawlins, Wyoming, approximately 0.7 mile south of the designated utility corridor and existing transmission line crossing and 3 miles south of I-80. Approximately 0.1 mile of reference line (4 acres of 250-foot-wide ROW) would be located within the CDNST SRMA. This is less than 1 percent of the SRMA, which covers about 600 acres and 82 miles of trail, and less than 0.1 percent of the entire 3,100-mile CDNST. The 2-mile transmission line corridor, in which roads or construction support areas could be located, encompasses a total of 180 acres of the CDNST SRMA. This is 68 percent of the SRMA.

The NST/SRMA is managed to provide primitive recreational experiences and the scenic trail has national importance. The proposed transmission line would not be consistent with SRMA management as a ROW avoidance area because the reference line would not be located within the designated utility corridor.

During construction, noise and activity would temporarily adversely affect the primitive recreation activity for which the trail and SRMA are managed. This would primarily affect the non-mechanized recreation user group (hikers, backpackers, and equestrians). The proposed trail and SRMA crossing would be located near an existing 230- to 287-kV transmission line and the I-80 crossing.

Towers would be placed to avoid surface disturbance near the actual trail. The structures and conductors would be “sky-lined,” with strong contrast for form, moderate contrasts for line and color, and weak contrast for texture. Visual impacts would remain for the life of the Project. There are no additional site-specific visual

mitigations (or relocation of the National Trail Management Corridor) proposed for this crossing because the transmission line would cross the NST perpendicularly at some point and would still be "sky-lined" with those contrasts (see Section 3.12, Visual Resources). However, the VRI rating for this area (Class B, with a score of 17) would not change.

Selection of Alternative I-A would not be consistent with management of the CDNST SRMA as a ROW avoidance area, but would not affect BLM's ability to effectively manage the nature and purposes of the entire CDNST, trail resources, qualities, values, uses (including public access and enjoyment), and associated settings because of the small percentage of trail and SRMA within the 250-foot-wide transmission line ROW (less than 0.1 percent of the entire CDNST and less than 1 percent of the CDNST SRMA), and because any existing recreational experience and character of the trail at this location is already impacted by existing linear structures (a 230- to 287-kV transmission line, a railroad, and the I-80 crossings) and industrial uses. However, expansion of disturbance from access roads and other facilities outside of the 250-foot-wide transmission line ROW and into the 2-mile transmission line corridor would increase the area of the SRMA in which the recreation experience is diminished. The following mitigation is proposed to further reduce impacts to the SDA and consolidate transmission line corridors and associated disturbance in a manner more consistent with SRMA management:

SDA-3*: If designated corridors exist within the SDA, the transmission reference line, new roads, and ancillary construction areas shall only be located within designated utility corridors.*

Application of this mitigation would allow Alternative I-A to remain consistent with SRMA management and would consolidate impacts to the CDNST from linear facilities; however, visual impacts would not be mitigated because the transmission line would still cross the NST perpendicularly and would be "sky-lined" with those contrasts. Recreation mitigation measures to reduce/restrict access roads (see Section 3.13, Recreation) would further reduce impacts to the NST and SRMA.

Alternative I-A would cross the Overland Trail at a point approximately 16 miles south of Wamsutter, Wyoming, about 1 mile west of the trail's intersection with Wamsutter Road and approximately 0.4 mile south of the Eureka Headquarters road (see **Figure 3.15-10**). The segment of trail crossed by the alternative is a contributing segment to the trail's overall NRHP eligibility. Towers would be placed to avoid surface disturbance near the actual trail; however, because towers are typically placed a maximum of 1,500 apart, it is unlikely that the alternative would comply with the Rawlins RMP including an NSU stipulation within 0.25 miles on both sides of the trail. The placement of this crossing near an existing road would be in compliance with the RMP stipulations that linear crossings of the trails occur in previously disturbed areas; however, the trail crossing would not be within a designated utility corridor.

Alternative I-A would be visible from the Overland Trail for 9 miles of trail, 5 of which (44 percent) are contributing segments. There are no associated recreation areas located near these trail segments and there are numerous well pads and access road in the area. The proposed trail crossing would be located on BLM land, but would not be within a designated utility corridor. The transmission line would be "sky-lined" (increased impact) in these areas (see Section 3.12, Visual Resources); however, scenic quality is low in this area (Class C, with an SQRU score of 6). There are no recreation areas, or interpretive features located near these segments. Duck Lake Station is located about 4 miles to the west of the crossing and would be outside of the viewshed.

Alternative I-A would cross the Cherokee Trail approximately 18 miles west of Baggs, Wyoming, near a small wash. The segment of trail that would be crossed by the alternative is a contributing segment to the trail's overall NRHP eligibility. Towers would be placed to avoid surface disturbance near the actual trail and would span washes and other natural features associated with the trail location; however, because towers are typically placed a maximum of 1,500 apart, it is unlikely that the alternative would comply with the Rawlins RMP, including an NSU stipulation within 0.25 mile on both sides of the trail. Additionally, the placement of this crossing would not be in compliance with the RMP stipulations that linear crossings of the trails occur in previously disturbed areas, and the crossing would be located in a designated utility corridor

for underground utilities only. A plan amendment would be required to allow aboveground utilities in this area.

Alternative I-A would be visible from the Cherokee Trail for approximately 24 miles of trail, 10 of which (40 percent) contribute to the trail's overall NRHP eligibility. The transmission line would be "sky-lined" (increased impact) in these areas, and the scenic quality rating would be reduced from Class B (with a SQRU score of 12) to Class C (see Section 3.12, Visual Resources). There are no associated historic sites, recreation areas, or interpretive features located near these segments.

Once the final route is selected, an intensive Class III inventory and in-depth visual analysis would be conducted to determine the impact to contributing Overland and Cherokee trail segments crossed by the route or from which the route would be visible. If as contributing segment would be adversely affected, the effects would be minimized or mitigated onsite or offsite as stipulated in the Cultural Resources PA developed for the Project, and through implementation of design features and BMPs in concert with the Trail Study Agency and the Wyoming BLM National Trails Management Program Lead. Mitigation identified in Section 3.12, Visual Resources, includes measures to reduce visual impacts through use of BLM environmental colors and location of structures, roads, and other project elements as far back from road, trail, and river crossings as possible, and, where feasible, employ terrain and vegetation to screen views from crossings.

Alternative I-B

Impacts to the Dinosaur National Monument would be the same as under Alternative I-A. Micro-siting adjustments affecting Dinosaur National Monument are discussed under Alternative I-D.

Impacts to the CDNST would identical to Alternative I-A because the location of the NST crossing would be identical.

Alternative I-B would cross one segment of the Overland Trail about 6 miles west of the trail's intersection with Wamsutter Road and immediately adjacent to the Eureka Headquarters road. The segment is a contributing segment to the trail's overall NRHP eligibility. Impacts from the crossing itself would be the similar to Alternative I-A, except that the trail crossing would be located on private land and not subject to compliance with the Rawlins RMP historic trail stipulations.

Alternative I-B would be visible from the Overland Trail for 10 miles of trail, 4 of which (40 percent) are contributing segments. There are no associated recreation areas or interpretive features located near these segments. The crossing would be located about 1.5 miles to the west of Duck Lake Station. Nothing remains at this site. Red Rock, a historical inscription site, would be located about 3.25 miles to the west of the crossing on private lands. The transmission line would be "sky-lined" (increased impact) in these areas (see Section 3.12, Visual Resources); however, scenic quality is low in this area (Class C, with an SQRU score of 6).

Alternative I-B would cross one segment of the Cherokee Trail in the same location as Alternative I-A. Impacts from the crossing itself, including compliance with the Rawlins RMP historic trail stipulations, would be identical to Alternative I-A. The transmission line would be visible for 9 miles of the trail, 4 of which (44 percent) would be contributing segments. There are no associated historic sites, recreation areas, or interpretive features located near these segments. The transmission line would be "sky-lined" (increased impact) in these areas, and the scenic quality rating would be reduced from Class B (with a SQRU score of 12) to Class C (see Section 3.12, Visual Resources).

Alternative I-C

Impacts to the Dinosaur National Monument would be the same as under Alternative I-A. Micro-siting adjustments affecting Dinosaur National Monument are discussed under Alternative I-D.

Impacts to the CDNST would be identical to Alternative I-A because the location of the NST crossing would be identical.

Alternative I-C would cross one segment of the Overland Trail along Highway 789, approximately 18 miles south of the intersection of Highway 789 and I-80. The segment of trail crossed by the alternative is a contributing segment to the trail's overall NRHP eligibility, and there is an interpretive sign located on Highway 789 where the trail crosses the highway. Towers would be placed to avoid surface disturbance near the actual trail; however, because the trail crossing would be located on private land, it would not be required to comply with the Rawlins RMP historic trail NSU stipulations.

Alternative I-C would be visible from the Overland Trail for 7 miles of trail, 6 of which (86 percent) are contributing segments. The transmission line would be "sky-lined" (increased impact) in these areas (see Section 3.12, Visual Resources); however, scenic quality is low in this area (Class C, with an SQRU score of 6). Washakie Station, a one of the few associated historic sites with standing ruins, is located about 3.75 miles east of the highway, near Muddy Creek. There are no developed recreation sites located near these segments.

Alternative I-C would cross one segment of the Cherokee Trail approximately 12 miles north of Baggs and less than one mile east of Highway 789. The segment of trail that would be crossed by the alternative contributes to the trail's overall NRHP eligibility. Towers would be placed to avoid surface disturbance near the actual trail and would span washes and other natural features associated with the trail location. Because towers are typically placed a maximum of 1,500 apart, it is unlikely that the alternative would comply with the Rawlins RMP's 0.25 mile NSU stipulation on both sides of the trail. Additionally, the trail crossing (located on BLM lands about one mile east of highway and outside of the designated utility corridor) would not be in compliance with the RMP stipulation that linear crossings of the trails occur in previously disturbed areas. A plan amendment would be required to allow expansion of the designated utility corridor to include the trail crossing.

Alternative I-C would be visible from the Cherokee Trail for approximately 11 miles of trail, 4 of which (36 percent) contribute to the trail's overall NRHP eligibility. There are no interpretive signs located on the highway and no associated historic sites located near these segments. However, Alternative I-C would cross Muddy Creek and Cherokee Creek, two perennial water sources that are associated with the Cherokee Trail and undoubtedly influenced the trail location. Alternative I-C would cross Muddy Creek about 1 mile north of the Cherokee Trail and would be located between the Highway and the trail crossing, within the expanded designated utility corridor. The Cherokee Creek crossing would be located directly adjacent to the proposed Cherokee Trail crossing and would also be located within the expanded designated utility corridor. The transmission line would be "sky-lined" (increased impact) in these areas, and the scenic quality rating would be reduced from Class B (with a SQRU score of 12) to Class C (see Section 3.12, Visual Resources).

Alternative I-D (Agency Preferred)

Under Alternative I-D, impacts to the Dinosaur National Monument would be the same as under Alternative I-A. The route for the 250-foot-wide transmission line ROW for Alternative I-D would cross a conservation easement (the Tuttle Easement) that prohibits overhead transmission line. Three micro-siting adjustments have been developed that would relocate the 250-foot-wide transmission line ROW outside of the easement area and closer to or within national monument lands.

- Under Tuttle Easement Micro-siting Option 1, the transmission reference line and 250-foot-wide transmission line ROW would remain within the Tuttle Easement but would be placed about 0.25 mile closer to Highway 40, following two existing transmission lines through the area with a 250-foot offset. Impacts to the Dinosaur National Monument would be the same as described under Alternative I-A; however the transmission line would be more noticeable from the Dinosaur National Monument lands because it would be closer.

- Under Tuttle Easement Micro-siting Option 2, the transmission reference line and 250-foot-wide transmission line ROW would be placed between the easement area and Dinosaur National Monument's Deerlodge Road. The reference line would cross Highway 40 twice and would be "sky-lined" in those areas. This micro-siting option would cause high impacts to high sensitivity recreational viewers (including visitors entering or leaving Dinosaur National Monument) in immediate foreground (0.0 to 0.5 miles) viewing situations (see Section 3.12, Visual Resources). There would be no additional disturbance within Dinosaur National Monument lands; however, during construction, the presence of construction equipment, personnel, or traffic would temporarily reduce the quality of site visitation during construction and could impede traffic of Highway 40. Access roads and staging areas also could be located on the west side of Highway 40, closer to the National Monument. BLM BMPs also would require consolidation of roads, support areas and other infrastructure to minimize disturbance and would require reclamation of any roads not needed for operations. Application of **SDA-1** and **SDA-2** would reduce direct impacts to Dinosaur National Monument; however, there would still be temporary impacts to quality of site visitation due to the proximity of road and staging area location, and there would be permanent visual impacts from the presence of the transmission line.
- Under Tuttle Easement Micro-siting Option 3, the transmission reference line and 250-foot-wide transmission line ROW would cross the NPS Deerlodge Road west of Highway 40. There would be approximately 1 acre of the 250-foot-wide transmission line ROW that would be within Dinosaur National Monument lands. The applicant would work with the NPS during development of the construction POD on tower micro-siting and construction timing to minimize visual impacts and ensure that project construction would not interfere with the timing of proposed road upgrades and would minimize impacts to recreational visitation. BLM BMPs also would require consolidation of nearby access roads, support areas, and other infrastructure to minimize disturbance and would require reclamation of any roads not needed for operations. Application of **SDA-1** and **SDA-2** would eliminate construction surface disturbance within the Deerlodge Road ROW and potential viewshed easement area and no vegetation clearing would be required within the 250-foot-wide transmission line ROW due to the height of existing vegetation in this area. The primary values and resources for which the park was designated or for which the park is managed (paleontological features, vegetation and wildlife, and river recreation) would be maintained; however, the transmission reference line would be "sky-lined" and would be visible from more mileage of Deerlodge Road and the placement of the line across Deerlodge Road would affect the ability of the NPS to protect visual quality along this portion of the road through the same types of scenic easements that are in place for portions of the road further within Dinosaur National Monument. Per 2006 NPS Park Management Policy, ROWs may be issued only pursuant to specific statutory authority, and generally only if there is no practicable alternative to such use of NPS lands. Alternatives to crossing the Dinosaur National Monument do exist, namely selection of Alternative I-D, or micro-siting options 1 and 2. Overall, the Tuttle Easement Micro-siting Option 3 would have increased impacts to the SDA as compared to Tuttle Easement options 1 and 2, because it crosses the most area of congressionally designated national monument lands and would affect the ability of the NPS to protect visual quality along this portion of the road for future generations.

Impacts to the CDNST would be identical to Alternative I-A, because the location of the NST crossing would be identical.

Alternative I-D would cross one segment of the Overland Trail, in the same location as Alternative I-A. Impacts from the crossing itself, including compliance with the Rawlins RMP historic trail stipulations would be identical to Alternative I-A. Alternative I-D would be visible from the Overland Trail for 9 miles, 4 of which (44 percent) are contributing segments.

Alternative I-D would cross the Cherokee Trail in three locations.

- Approximately 14 miles north of Baggs and 3 miles west of Highway 789. The crossing would be adjacent to an oil and gas access road. There are no associated historic sites, recreation areas, or interpretive features located near trail segments in this area. The trail crossing would be located on BLM land and would not be located within a designated utility corridor. The transmission line would be "sky-lined" (increased impact) in these areas, and the scenic quality rating would be reduced from Class B (with a SQRU score of 12) to Class C (see Section 3.12, Visual Resources).
- Approximately 13 miles west of Baggs, Wyoming, near the junction of Shell Creek Stock, Poison Butte, and W. Hangout Roads. The segment of trail that would be crossed is located in a wash that drains into the Little Snake River. There are no associated historic sites, recreation areas, or interpretive features near trail segments in this area. The trail crossing would be located on BLM land and would not be within a designated utility corridor. The transmission line would be "sky-lined" (increased impact) in these areas (see Section 3.12, Visual Resources); however, scenic quality is low in this area (Class C, with an SQRU score of 9.5).
- Approximately 3.5 miles southwest of the crossing near Creek Stock/Poison Butte/W. Hangout roads and 2.5 miles southeast of the proposed Alternative I-A/I-B crossing. There are no associated historic sites, recreation areas, or interpretive features near trail segments in this area. The trail crossing would be located on BLM land and would not be within a designated utility corridor. The transmission line would be "sky-lined" (increased impact) in these areas, and the scenic quality rating would be reduced from Class B (with a SQRU score of 12) to Class C (see Section 3.12, Visual Resources).

All three segments of the Overland Trail that would be crossed by the alternative are non-contributing segments to the trail's overall NRHP eligibility. Towers would be placed to avoid surface disturbance near the actual trail and washes; however, because towers are typically placed a maximum of 1, 500 apart, it is unlikely that the alternative would comply with the Rawlins RMP, including an NSU stipulation within 0.25 mile on both sides of the trail. Additionally, the placement of this crossing would not be in compliance with the RMP stipulation that linear crossings of the trails occur in previously disturbed areas. Per the Rawlins FO RMP, non-contributing segments are not managed for the preservation of historic values; however, the RMP does not fully address trail corridor management with regard to compliance with the BLM National Trails Manuals series. A plan amendment would be required to designate a new Wamsutter-Baggs-Powder Rim Corridor.

Alternative I-D would be visible from the Cherokee Trail for approximately 28 miles, 10 of which (36 percent) are contributing segments. There are no associated historic sites, recreation areas, or interpretive features near trail segments in this area.

Alternative Variation in Region I

There are no alternative variations within Region I.

Alternative Connectors in Region I

There are no SDAs affected by the Mexican Flats, Baggs, Fivemile Point North, or Fivemile Point South alternative connectors.

Alternative Ground Electrode Systems in Region I

A ground electrode system of approximately 600 acres in size would be necessary in Region I within 50 to 100 miles of the northern terminal, as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the project proponent. The ground electrode system alternative locations in Region I are depicted in Chapter 2.0 on **Figure 2-21**. The conceptual sites would not include any SDAs; however, the Shell Creek

ground electrode system siting area would include 34 acres within the Adobe Town WSA (a designated ROW exclusion area) and 238 acres within the Monument Valley SMA. The Eight-mile Basin ground electrode system siting area includes 406 acres of the CDNST.

The following mitigation is proposed to eliminate impacts to these areas:

***SDA-4**: Ground electrode systems shall be sited outside of any designated SDAs located within the ground electrode siting areas.*

Application of this mitigation would eliminate impacts to these SDAs.

Application of **SDA-1** (avoidance of new road construction in SDAs) would eliminate construction of any access roads within this area.

Region I Conclusions

Alternatives I-A, I-B, I-C, and I-D would have equal effect on the CDNST and the Dinosaur National Monument Deerlodge Park road. Application of design features (**Appendix C**) and mitigation would minimize the impacts to Dinosaur National Monument through avoidance of SDAs and road reclamation, but there would be temporary impacts to visitors from construction noise and some visual impacts to park visitors entering/exiting the park during operations. The Tuttle Easement micro-siting options 1, 2, and 3 would result in increasingly greater impacts to Dinosaur National Monument lands.

The alternatives would not be consistent with management of the CDNST SRMA as an ROW avoidance area, but would not affect BLM's ability to effectively manage the nature and purposes of the entire 3,100-mile CDNST, trail resources, qualities, values, uses (including public access and enjoyment), and associated settings because of the small percentage of trail affected (less than 0.1 percent of the entire CDNST and less than 1 percent of the CDNST SRMA). Additionally, any existing recreational experience and character of the trail at this location is already impacted by existing linear structures (a 230- to 287-kV transmission line, a railroad, and the I-80 crossings) and industrial uses. There are no additional site-specific visual mitigations (or relocation of the National Trail Management Corridor) proposed for this crossing because the transmission line would cross the NST perpendicularly at some point and would still be "sky-lined" with those contrasts (see Section 3.12, Visual Resources).

Alternative I-A, I-B, and I-D would each cross one contributing segment of the Overland Trail and be visible for similar amounts of trail mileage contributing to NRHP eligibility. However, Alternatives I-A and I-D would not be located near any associated historic sites and natural features, or nearby recreation or interpretive features; whereas, Alternative I-B would be located near Duck Lake station and Red Rock historic sites. Alternative I-C would have the greatest impacts on the Overland Trail management, as it would cross one contributing segment of the Overland Trail, would affect the viewshed of the most trail mileage contributing to the trail's NHT status, would be located adjacent to an interpretive sign on Highway 789, and would be located near the Washakie Station historic site and Muddy Creek, a perennial waterbody of importance to trail travelers. The alternatives that would be located on BLM land (I-A and I-D) would not be compliant with the RMP 0.25-mile NSU stipulations.

Alternative I-A would have the greatest impacts to the Cherokee Trail, as it would cross one segment contributing to the trail's NHT status, would be visible from the most miles of contributing segments, and would result in a reduction in scenic quality (from Class B to Class C) for areas surrounding the trail. However, it would not be located near any associated historic sites and natural features or nearby recreation or interpretive features. Alternative I-D would only cross non-contributing segments and would not be located near any associated historic sites and natural features or nearby recreation or interpretive features. However, this alternative would also be visible from 10 miles of contributing segments and the scenic quality for portions of the trail would be reduced from Class B to Class C. Alternatives I-B and I-C both would cross one contributing segment each and would also be visible from 6 fewer miles of contributing segments than

Alternatives I-A and I-D. Both would result in reduction in scenic quality (from Class B to Class C) for areas surrounding the trail. However, Alternative I-C also would cross Muddy Creek and Cherokee Creek, perennial waterbodies of importance to trail travelers. The alternatives that would be located on contributing segments on BLM land (I-A, I-B, and I-C) would not be compliant with the RMP 0.25-mile NSU stipulations.

Once the final route is selected, an intensive Class III inventory and in-depth visual analysis would be conducted to determine the impact to contributing segments of the Overland and Cherokee trails crossed by the route or from which the route would be visible. If a contributing segment would be adversely affected, the effects would be minimized or mitigated onsite or offsite as stipulated in the Cultural Resources PA developed for the Project and through implementation of design features and BMPs in concert with the Trail Study Agency and the Wyoming BLM National Trails Management Program Lead. Mitigation identified in Section 3.12, Visual Resources, includes measures to reduce visual impacts through use of BLM environmental colors and location of structures, roads, and other project elements as far back from road, trail, and river crossings as possible, and, where feasible, employ terrain and vegetation to screen views from crossings.

3.15.4.4 Region II

Tables 3.15-7 through **3.15-10** provide a list of the SDAs that would be crossed by the proposed 250-foot-wide transmission line ROW under all alternatives and areas that would be located within the 2-mile transmission line corridors. These areas are depicted in **Figures 3.15-2**, **3.15-6**, **3.15-11**, and **3.15-13** through **3.15-15**.

Alternative II-A (Applicant Proposed)

BLM SDAs and National Landscape Conservation System lands

Alternative II-A would not cross any lands within the National Landscape Conservation System Lands or BLM-designated ACECs.

USFS IRAs and URUD Areas

The Alternative II-A 250-foot-wide transmission line ROW would cross approximately 2 miles of the Chipman Creek IRA within the Uinta National Forest and 3 miles of IRA/URUD areas within the Manti-LaSal National Forest. The 2-mile transmission line corridor would encompass portions of seven additional IRAs within the Uinta National Forest.

Within the Upper Spanish Fork management area (MA) of the Uinta National Forest, the 250-foot-wide transmission line ROW would be primarily within a designated utility corridor that is located between five IRAs, except for a 2-mile section where the designated utility corridor shifts abruptly to the east following Forest Road #335 and an existing transmission line located to the east side of the road. In this area, approximately 2 miles of the 250-foot-wide transmission line ROW would cross the 9,349-acre IRA #418008 (Chipman Creek). The 250-foot-wide transmission line ROW would re-enter the designated corridor when the road and transmission line shift back to the west (**Figure 3.15-14**). The proposed route would be located about 0.25 mile from the edge of the Chipman Creek IRA and the road. This would essentially widen the linear corridor in this area, as the portion of the IRA between the transmission line and the road would be separated from the rest of the IRA and would lose wilderness character.

Use of a full 250-foot-wide transmission line ROW would result in up to 74 acres of vegetation removal within the Chipman Creek IRA (0.8 percent of the 9,349-acre IRA). Roadless construction methods (as identified in the PDTR, see **Appendix D**) would be utilized within IRAs to ensure compliance with the Roadless Rule. These include use of helicopters for tower placement, use of existing roads, and overland travel. Application of the roadless construction techniques within IRAs would reduce the ROW within the IRA to about 30 acres and would eliminate surface disturbance associated with new roads within the IRA.

Table 3.15-7 Region II: BLM SDAs within 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Land Management Agency	Special Designation Area	Alternative II-A 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-B 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-C 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-D 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-E 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-F 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)
BLM White River FO	Oil Spring Mountain WSA and ACEC	N/A	0/<1 1,241	0/<1 1,241	N/A	N/A	N/A
	White River Riparian ACEC	N/A	0/0 143	0/0 143	N/A	N/A	N/A
BLM Grand Junction FO	McInnis Canyons NCA	N/A	0/0 1,925	0/0 1,925	N/A	N/A	N/A
	Badger Wash ACEC	N/A	0/0 310	0/0 310	N/A	N/A	N/A
	Demaree WSA	N/A	1/15 1,812	1/15 1,812	N/A	N/A	N/A
BLM Vernal FO	Lower Green River ACEC	N/A	N/A	N/A	1/20 1,239	N/A	1/20 1,239
	Lower Green River WSR	N/A	N/A	N/A	1/19 1,447	N/A	1/19 1,447
	Lears Canyon ACEC	N/A	N/A	N/A	0 489	N/A	0 489
	Nine Mile Canyon ACEC	N/A	N/A	N/A	0 1,453	N/A	0 1,453
Price FO	San Rafael Canyon ACEC	N/A	N/A	0/0 1,192	N/A	N/A	N/A
	Rock Art ACEC	N/A	N/A	0 123	N/A	N/A	N/A

Note: In some instances, there may be “0” miles within an SDA but some acreage of 250-foot-wide transmission line ROW disclosed. This is because the reference line (which is identified through “mileage of 250-foot-wide ROW”) does not enter the SDA; however, there is some portion of the 250-foot-wide transmission line ROW (as disclosed in acreage) that is still located within the SDA.

Table 3.15-8 Region II: USFS IRAs within 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

National Forest	IRA	Alternative II-A 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-B 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-C 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-D 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-E 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-F 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)
Ashley	IRA 401009	N/A	N/A	N/A	1/11 4,113	N/A	1/11 4,113
	IRA 401010	N/A	N/A	N/A	N/A	3/133 7,601	N/A
	IRA 401011	N/A	N/A	N/A	N/A	0/36 7,630	0/0 18
	IRA 401012	N/A	N/A	N/A	N/A	N/A	0/5 734
	IRA 401013	N/A	N/A	N/A	N/A	N/A	0/0 285
Fishlake	North Pavant IRA	N/A	N/A	0/0 1,257	N/A	N/A	N/A
	Oak Creek IRA	N/A	0/0 13	N/A	N/A	N/A	0/0 13
Manti-La Sal	Boulger-Black Canyon IRA	N/A	0/0 1,414	N/A	N/A	N/A	N/A
	Cedar Knoll IRA	1/16 726	N/A	N/A	N/A	1/16 726	1/16 726
	Coal Hollow IRA	1/19 1,713	N/A	N/A	N/A	1/19 1,713	1/19 1,713
	East Mountain IRA	N/A	0/0 1,902	N/A	N/A	N/A	N/A
	Nuck Woodward IRA	N/A	N/A	N/A	0/0 51	N/A	N/A
	Oak Creek IRA	N/A	N/A	N/A	0/0 786	N/A	N/A
	Sanpitch IRA	N/A	0/0 1,262	N/A	0/0 19	0/0 19	0/0 19

Table 3.15-8 Region II: USFS IRAs within 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

National Forest	IRA	Alternative II-A 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-B 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-C 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-D 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-E 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-F 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)
Uinta	IRA 418008/Chipman Creek	2/74 1,213	N/A	N/A	N/A	N/A	N/A
	IRA 418009/Willow Creek	0/0 5,605	N/A	N/A	N/A	N/A	N/A
	IRA 418015/Strawberry Ridge	0/0 8	N/A	N/A	N/A	N/A	N/A
	IRA 418016/Diamond Fork	0/0 40	N/A	N/A	N/A	0/0 29	0/0 29
	IRA 418017/Tie Fork	0/0 5,096	N/A	N/A	N/A	0/0 2,732	0/0 2,732
	IRA 418019/Soldier Summit	N/A	N/A	N/A	N/A	N/A	1/32 405
	IRA 418021/Hop Creek Ridge	0/0 4	N/A	N/A	0/0 4	0/0 4	0/0 4
	IRA 418028/Golden Ridge	0/0 980	N/A	N/A	N/A	0/0 980	0/0 980
	IRA 418029/Nephi	0/0 14	N/A	N/A	0/0 4	0/0 4	0/0 4

Note: In some instances, there may be “0” miles within an SDA but some acreage of 250-foot-wide transmission line ROW disclosed. This is because the reference line (which is identified through “mileage of 250-foot-wide ROW”) does not enter the SDA; however, there is some portion of the 250-foot-wide transmission line ROW (as disclosed in acreage) that is still located within the SDA.

Table 3.15-9 Region II: USFS URUD Areas Within 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

National Forest[1]	Unroaded/Undeveloped Areas	Alternative II-A 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-B 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-C 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-D 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-E 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-F 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)
Ashley	Alkali Canyon	N/A	N/A	N/A	0/0 1,856	N/A	0/0 1,856
	Cottonwood	N/A	N/A	N/A	N/A	0/36 7,302	N/A
	First Canyon	N/A	N/A	N/A	N/A	N/A	0/0 147
	Mill Hollow	N/A	N/A	N/A	N/A	N/A	0/0 172
	Right Hand Fork	N/A	N/A	N/A	N/A	N/A	0/<1 422
	Sowers Canyon East	N/A	N/A	N/A	N/A	3/117 7,330	N/A
Fishlake	Browns Hole	N/A	N/A	7/198 5,230	N/A	N/A	N/A
	Moroni Peak	N/A	N/A	0/0 100	N/A	N/A	N/A
	Mount Terrill	N/A	N/A	0/0 984	N/A	N/A	N/A
	North Pavant	N/A	N/A	0/0 2,054	N/A	N/A	N/A
	Oak Creek	N/A	0/0 191	N/A	N/A	N/A	0/0 191
	Oak Ridge	N/A	N/A	0/0 2,655	N/A	N/A	N/A
	The Rocks	N/A	N/A	0/0 325	N/A	N/A	N/A
Manti-La Sal	Boulger-Black Canyon	N/A	0/0 875	N/A	N/A	N/A	N/A
	East Mountain	N/A	0/0 1,818	N/A	N/A	N/A	N/A

Table 3.15-9 Region II: USFS URUD Areas Within 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

National Forest[1]	Unroaded/Undeveloped Areas	Alternative II-A 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-B 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-C 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-D 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-E 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)	Alternative II-F 250-foot-wide ROW (miles/acres) 2-mile corridor (acres)
Manti-La Sal (continued)	Nuck Woodward – Gentry Mountain	N/A	N/A	N/A	0/0 52	N/A	N/A
	Oak Creek	N/A	N/A	N/A	0/0 1,016	N/A	N/A
	Cedar Knoll	1/34 2,218	N/A	N/A	N/A	1/34 2,218	1/34 2,218
	Coal Hollow	1/27 1,754	N/A	N/A	N/A	1/27 1,754	1/27 1,754
	Sanpitch Mountains	1/10 66	1/35 1,617	N/A	1/11 241	1/11 66	1/11 241

[1] There are no URUD areas within the Uinta National Forest.

Note: In some instances, there may be “0” miles within an SDA but some acreage of 250-foot-wide transmission line ROW disclosed. This is because the reference line (which is identified through “mileage of 250-foot-wide ROW”) does not enter the SDA; however, there is some portion of the 250-foot-wide transmission line ROW (as disclosed in acreage) that is still located within the SDA.

Table 3.15-10 Region II: Other Federally Managed Special Designation Areas Within 250-foot-wide Transmission Line ROW and 2-mile Transmission Line Corridor

Land Management Agency	SDA	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
NPS	Dinosaur National Monument	0/0 3	N/A	N/A	0/0 3	0/0 3	0/0 3
BLM/NPS	Old Spanish NHT						
	Number of crossings and segment rating	0 segment crossed	4 segments crossed; 1 segment NHT II, 1 segment NHT III, 2 segments NHT V	9 segments crossed: 1 segment NHT II, 1 segment NHT III, 3 segments NHT V, and 4 segments not categorized	0 segments crossed	0 segments crossed	0 segments crossed
	Visibility of the alternative from the trail[1]	N/A	Visible along 58 miles of trail, of which 7 miles are NHT II, 6 miles are NHT III, 27 miles are NHT IV, and 18 miles are NHT V	Visible along 107 miles of trail, of which 17 miles are NHT II, 8 miles are NHT III, 31 miles are NHT IV, and 27 miles are NHT V, and 24 miles are not categorized	N/A	N/A	N/A
	Associated Historic Sites and natural features, and nearby recreation or interpretive features	N/A	N/A	N/A	N/A	N/A	N/A
	Management/Land Use	N/A	All crossing on BLM lands, within designated utility corridors	5 crossings on BLM lands within designated corridor, 4 crossings on USFS land (unevaluated)	N/A	N/A	N/A

During construction, there would be surface disturbance within the Chipman Creek IRA associated with overland travel as well as the vegetation removal and surface disturbance from the transmission line placement (up to 23 acres). TransWest would span sensitive resources (such as threatened and endangered habitat, cultural resources, wetlands, etc.; see **Appendix C** for a full list of design features) and use selective vegetation removal whenever possible to reduce resource impacts. Helicopter construction would require the use of 7-acre helicopter fly yards located every five miles along the area where helicopter construction is planned; however, it is anticipated that these would be located outside of the IRA. Application of design features in **Appendix C**, specifically the development of vegetation and noxious weed management plans to address plant removal, selective clearing, and reclamation consistent with agency permitting stipulations for soils, water, vegetation and wildlife, would also reduce impacts to habitat and wildlife throughout the area. There is no crucial winter big game habitat within the IRA. Reclamation areas would be monitored for 3 to 5 years in accordance with USFS requirements (see **Appendix D**). As a result, the limited amount of construction ground disturbance within the IRA would not impact the diversity of plants and animals within the IRA. There are no impaired streams within the IRA. TransWest would use Design Features and BMPs to reduce sedimentation to protect water resources within the IRA. All disturbance areas within the IRA would be in areas designated as roaded natural and roaded modified ROS. These types of areas are managed to allow for readily evident to moderate evidence of sights and sounds of human activity. The sights and sounds of construction would be consistent with ROS designations for this area (see Section 3.13 Recreation, for more information).

During operations, TransWest would use aircraft or non-motorized methods for maintenance and would work with the USFS to identify appropriate vegetation management techniques, control the use of the ROW, and prevent unauthorized travel along the ROW by off-road vehicles. Standard vegetation management techniques would result in a 250-foot-wide corridor of low growth plant communities ranging from 2 to 6 feet in height. Depending on the location and habitat type, this type of vegetation management could result in long term loss of wildlife habitat. The following mitigation is proposed to further reduce operational impacts:

***SDA-5**: Within IRAs and other SDAs of high scenic quality, Level 2 or Level 3 vegetation management methods would be utilized as needed to reduce impacts to wildlife habitat and reduce the level of habitat fragmentation during operations.*

Application of this mitigation would result in minimized disturbance to wildlife habitat. Level 2 vegetation management would reduce the area with 6-foot vegetation height restrictions to 90 feet wide and allow vegetation at the outside edges of the ROW to reach a maximum height of 35 feet. Level 3 vegetation management would allow increased vegetation heights anywhere within the ROW as along as vegetation does not encroach on the required minimum clearances (about 29 feet).

There are no known cultural resource sites within the Chipman Creek IRA (418008) area and no other special features or values characterizing wilderness potential present within the IRA. Impacts to any cultural resource sites would be mitigated per the PA (see Section 3.11, Cultural Resources).

Overall, the impacts associated with construction, operation, and maintenance would result in a permanent loss of acres where the Project would cross the IRA. The existing landscape character of the Chipman Creek IRA would be modified by the presence of the transmission line within the IRA. Although the route would largely parallel an existing transmission line, the existing transmission line is located outside of the Chipman Creek IRA and east of the existing road. The placement of Alternative II-A approximately 0.25 mile into the Chipman Creek IRA and away from the road would position the transmission line away from the existing man-made features that have affected wilderness character to the east. This would diminish the natural appearance and undeveloped character of a larger portion of the IRA and widen the linear corridor, as a 372-acre portion of the IRA between transmission reference line and Forest Road #335 would essentially be separated from the rest of the IRA. Within that separated acreage, a 7-acre portion would be further separated by a short, unnamed cherry-stemmed road. These areas would lose wilderness character and opportunities for solitude and primitive recreation in or near those areas, if any exist. Additionally, the 250-foot-wide transmission line ROW would cross the Forest Road #335 in a perpendicular fashion before

and after crossing the IRA. These crossings would provide opportunity for unauthorized OHV use within the IRA. Overall, these changes in the wilderness qualities would not be large enough to preclude management of the IRA as a whole; however, the manageability of the area between the transmission line and Forest Road #335 likely would be lowered. Visual impacts and proposed mitigation are discussed in greater detail in Section 3.12, Visual Resources.

Three micro-siting options have been proposed to reduce impacts to the Chipman Creek IRA:

- Strawberry IRA Micro-siting Option 1 would site the reference line and 250-foot-wide transmission line ROW approximately 0.1 mile to the west of the proposed route for Alternative II-A. Miles of reference line and acres of 250-foot-wide transmission line ROW within the IRA would remain about the same (2 miles and 71 acres). Like Alternative II-A, the 250-foot-wide transmission line ROW would cross Forest Road #335 in a perpendicular fashion at the points where it enters and leaves the IRA. This would provide opportunity for unauthorized OHV use within the IRA. Impacts to the IRA area would be similar to those described above, but would reduce the amount of area between the transmission line and Forest Road #335 to 225 acres. This area, which likely would lose wilderness character and have lower manageability, is 148 acres less than under Alternative II-A. Impacts to Forest Road #335 road are discussed in Section 3.12, Visual Resources, and Section 3.13, Recreation.
- Strawberry Micro-siting Option 2 would site the reference line and 250-foot-wide transmission line ROW approximately 0.2 mile to the west of the proposed route for Alternative II-A. Miles of reference line within the IRA would remain at about approximately 2 miles, and the acres of 250-foot-wide transmission line ROW would be reduced from 74 to 66 acres within the IRA. This would be further reduced to about 26 acres through application of roadless construction techniques. Like Alternative II-A, the 250-foot-wide transmission line ROW would cross Forest Road #335 in a perpendicular fashion at the points where it enters and leaves the IRA. However, the 250-foot-wide ROW also would be adjacent to the road for about 0.4 miles and would have two additional road crossings at about the halfway point of the 2-mile segment. This would result in more opportunity for encroachment into the IRA by OHVs than either Alternative II-A or Micro-siting Option 1 and ultimately could compromise manageability of this IRA border. Impacts to Forest Road #335 are discussed in Section 3.12, Visual Resources, and Section 3.13, Recreation.
- Strawberry IRA Micro-siting Option 3 would site the reference line and 250-foot-wide transmission line ROW approximately 0.3 mile to the west of the proposed route for Alternative II-A. This would remove the reference line and 250-foot-wide transmission line ROW from the Chipman Creek IRA entirely. The reference line would cross the road and existing transmission line near the beginning and end of this 2-mile segment and would cross Forest Road #335 three more times at about the halfway point. Selection of Micro-siting Option 3 would result in the closets consolidation of the road and transmission lines that would be visible within the IRA and affect wilderness character. Although this option would cross the road five times, all crossings would be outside of the IRA and would not provide more opportunity for encroachment into the IRA. Impacts to Forest Road #335 are discussed in Section 3.12, Visual Resources, and Section 3.13, Recreation.

The 2-mile transmission line corridor would encompass additional portions the Chipman Creek IRA, as well as portions of seven IRAs within the Upper Spanish Fork, Thistle, and Nephi MAs (approximately 12,960 acres total; see **Table 3.15-8**). Access road construction within IRAs would not be in conformance with area management plans. Application of **SDA-1** (avoidance of new road construction in SDAs) and adherence to the Roadless Rule as described in **Appendices C** and **D** would eliminate these areas from use for access roads. Roadless construction methods (as identified in the PDTR, see **Appendix D**) would be utilized to ensure compliance with the Roadless Rule. These methods include use of helicopters for tower placement, use of existing roads, and overland travel.

Within the Manti-La Sal National Forest, the 250-foot-wide transmission line ROW would cross the Coal Hollow and Cedar Knoll IRA/URUD areas. IRAs and URUD areas generally comprise the same acreage,

but there are approximately 800 acres of the Coal Hollow URUD area and 6,000 acres of the Cedar Knoll URUD area that are outside of their respective IRAs. Approximately 1 mile of the 250-foot-wide transmission line ROW would cross the 6,264-acre Coal Hollow IRA (7,094-acre URUD area) and 1 mile would cross the 22,483-acre Cedar Knoll IRA (28,349-acre URUD area). The disturbances would be located on the north and western edges of the IRA/URUD area, respectively (see **Figure 3.15-14**), leaving all but small portions (over 99.7 percent of Coal Hollow IRA/URUD area and 99.9 percent of Cedar Knoll IRA/URUD area) unfragmented and well over the requisite 5,000 acres, and with minimal effect to manageability.

Coal Hollow and Cedar Knoll IRA/URUD areas were rated as having low/medium natural integrity/appearance, low solitude and primitive recreation opportunities, and low manageability as wilderness due to previous and current land uses, sights and sounds of the trains and traffic, and OHV use (USFS unpublished). Within affected portions of these IRA/URUD areas, the transmission line generally would parallel Highway 6 and 89 and one or more existing transmission lines. Use of a full 250-foot-wide transmission line ROW would result in up to 19 acres of vegetation removal within the Coal Hollow IRA/URUD area, all of which would be located within the IRA, and 34 acres of vegetation would be removed within the Cedar Knoll URUD area, 16 of which would be located within the IRA. Roadless construction methods (as identified in the PDTR, see **Appendix D**) would be utilized within IRAs to ensure compliance with the Roadless Rule. These methods include use of helicopters for tower placement, use of existing roads, and overland travel. Application of the roadless construction techniques within IRAs would eliminate the surface disturbance associated with new roads within the IRA and reduce the ROW within the Coal Hollow and Cedar Knoll IRAs to about 8 acres and 6 acres, respectively.

During construction, there would be surface disturbance within the Coal Hollow and Cedar Knoll IRAs associated with overland travel as well as the vegetation removal and surface disturbance from the transmission line placement itself (up to 14 acres). As discussed above (see the Chipman Creek IRA), TransWest would span sensitive resources and use selective vegetation removal whenever possible to reduce resource impacts. Applicable design features such as USFS timing restrictions within crucial winter big game habitat and development of noxious weed management also would reduce impacts to habitat and wildlife throughout the area. As a result, the limited amount of construction ground disturbance within the IRAs would not impact the diversity of plants and animals within the IRAs. There are no impaired streams within the IRAs/URUD areas. TransWest would use Design Features and BMPs to reduce sedimentation to protect water resources within the IRA/URUD areas, and there would be no impact to the irrigation and community water supplies for Spanish Fork and Utah County.

Within the Coal Hollow and Cedar Knoll IRAs, approximately 25 acres of the full 250-foot-wide transmission line ROW would be located in areas designated as Semi-Primitive Motorized ROS. The sights and sounds of construction would not be fully consistent with management goals for this ROS designation (see Section 3.13 Recreation, for more information about impact to ROS areas from construction and operation of the transmission line).

Impacts from operations and maintenance would be similar to those discussed under Chipman Creek IRA and would be reduced through application of **SDA-5** (Class 2 or Class 3 vegetation maintenance options). Application of this mitigation would minimize disturbance to wildlife habitat. Level 2 vegetation management would reduce the area with 6 foot vegetation height restrictions to 90 feet wide and allow vegetation at the outside edges of the ROW to reach a maximum height of 35 feet. Level 3 vegetation management would allow increased vegetation heights anywhere within the ROW as along as vegetation does not encroach on the required minimum clearances (about 29 feet).

The placement of Alternative II-A across the edge of the IRAs would result in one 74-acre portion of the Cedar Knoll IRA and one 47-acre portion of the Coal Hollow IRA being segmented from the rest of IRAs. The existing landscape character of these areas and the adjoining portions of the IRAs would be modified by the presence of the transmission line within the IRA; however the route would parallel one or more existing transmission lines and would be located in areas where existing man-made features have already affected wilderness character. Visual impacts and proposed mitigation are discussed in greater detail in

Section 3.12, Visual Resources. There are no known cultural resources sites within either IRA and no other special features or values characterizing wilderness potential present within the IRA. Impacts to any cultural resource sites would be mitigated per the PA (see Section 3.11, Cultural Resources and Native American Concerns).

Overall, the impacts associated with construction, operation, and maintenance would result in a permanent loss of acres where the Project would cross the Coal Hollow and Cedar Knoll IRAs and would further diminish the natural appearance and undeveloped character of the outermost portion of IRAs. However, due to the location of Alternative II-A (at the edge of the IRA and in close proximity to roads and existing structures that have already comprised the wilderness characteristics of the area), it is not expected that any opportunities for solitude and primitive recreation present within the IRAs would be impacted, and any changes in the wilderness qualities would not be large enough to preclude management of the areas as IRAs and/or wilderness.

The reference line and 250-foot-wide transmission line ROW also would cross 1 mile (10 acres) of the Sanpitch URUD area. The affected acreage would be outside of the Sanpitch IRA. The crossing would be adjacent to other linear features and would be at the outermost portion of the URUD area where opportunities for primitive recreation and solitude are not present. In addition, the 2-mile transmission line corridor in which access roads or other construction support areas also could be located would encompass 3,926 acres within the Coal Hollow and Cedar Knoll URUD areas (1,439 acres of which are located within the IRAs), as well as 66 acres within the Sanpitch URUD area (see **Tables 3.15-8** and **3.15-9**). While access road construction within IRAs would not be in conformance with area management (see roadless construction techniques described above); there is no specific management restriction precluding road development in URUD areas outside of IRAs, provided the appropriate Standard and Guidelines are met. Therefore, any construction within the approximately 1,500 acres of URUD area outside of the Coal Hollow and Cedar Knoll IRAs and the 66 acres within the Sanpitch URUD area would not be required to adhere to roadless construction techniques. As a result, these areas could be subject to access road and support facility development that would result in additional surface disturbance and/or vegetation removal, with concomitant impacts to wildlife habitat, opportunities for solitude and primitive recreation, and wilderness character. The following mitigation is proposed to reduce impacts to URUD areas:

SDA-6*: Roadless construction techniques shall be applied within all portions of URUD areas located outside of IRA until the national forests have completed their LRMP revisions including IRA and/or wilderness designation decisions.*

Application of **SDA-6** would eliminate all portions of the 2-mile transmission line corridor within URUD areas from use for access roads or staging areas. This would eliminate most potential impacts to wilderness qualities except for the visual impacts described above and would allow the Manti-La Sal National Forest to continue to consider these areas for IRA and/or wilderness designation when they complete their LRMP revision.

Two micro-siting options have been proposed to reduce impacts to the Cedar Knoll IRA/URUD area:

- Cedar Knoll IRA Micro-siting Option 1 would site the reference line and 250-foot-wide transmission line ROW approximately 0.2 mile to the west of the proposed route for Alternative II-A. This would reduce the miles of reference line within the Cedar Knoll IRA to less than 0.5 mile and the acres of 250-foot-wide transmission line ROW from 34 to 12 acres within the URUD area (and from 16 acres to about 9 acres within the IRA itself, which would be further reduced to about four acres through application of roadless construction techniques). The area of the Cedar Knoll IRA that would be separated from the IRA would be reduced to 22 acres (52 acres less than under Alternative II-A) and no portion of the Coal Hollow IRA would be separated from the IRA. Impacts to the IRA/URUD area would be similar to those described above but would affect half the IRA acreage and about one third of the URUD areas impacted under Alternative II-A. Additionally, the reference line would

be located closer to existing transmission lines, consolidating manmade features affecting the character of the IRA.

- Cedar Knoll IRA Micro-siting Option 2 would site the reference line and 250-foot-wide transmission line ROW approximately 0.5 mile to the west of the proposed route for Alternative II-A. This would remove the reference and line and 250-foot-wide corridor from the Cedar Knoll IRA and URUD areas entirely. Additionally, the reference line would be located closer to existing transmission lines, further consolidating manmade features that are visible within the IRA and affecting its wilderness character.

Other Federally Managed SDAs and National Trails

Approximately 3 acres of the Dinosaur National Monument (less than 0.001 percent of the 210,000+-acre area) would be located within the 2-mile transmission line corridor. Application of **SDA-1** would eliminate impacts to the important geological and paleontological resources and native habitat within the designated area. There would be no impact to national trails.

Alternative II-B

Under Alternative II-B, the 250-foot-wide transmission line ROW would pass through the Oil Spring Mountain WSA/ACEC, the Demaree WSA, and the Sanpitch URUD area. Portions of the 2-mile transmission line corridor in which roads or construction support areas could be located also would cross one NCA, two additional ACECS, and three additional IRA/URUD areas.

BLM SDAs and National Landscape Conservation System Lands

Within the White River FO, a small portion of the 250-foot-wide transmission line ROW (less than 1 acre) would pass through the 18,260-acre Oil Spring Mountain WSA/ACEC. This would be less than 0.001 percent of the SDA. The Oil Spring Mountain WSA is a ROW exclusion area; development of the portion of the 250-foot-wide transmission line ROW within the WSA/ACEC would not be in conformance with management unless the area is released from consideration as wilderness. The reference line would not enter the WSA/ACEC, but would be located within a designated underground utility corridor west of the WSA. TransWest design features to span or compress the width of the ROW corridor would eliminate surface disturbance within the WSA; however, the visual impacts to the WSA from operation of the line would not be mitigated, and a land use plan amendment would be required to change the designated use of the utility corridor to allow overhead transmission lines. The White River FO has recommended that the WSA not be carried forward as wilderness, but instead designated as an ACEC; if released by Congress, the ACEC would be managed as a ROW avoidance area and closed to motorized vehicles to protect its relevant and important values, which include spruce-fir and biologically diverse plant communities, BLM sensitive species, and remnant vegetation associations (RVA). Approximately 1,241acres of the of the 2-mile transmission line corridor would be located within the WSA/ACEC (6.8 percent of the ACEC). The designated utility corridor would not encompass the full width of the 2-mile transmission line corridor. Application of **SDA-1** would eliminate road construction impacts to the WSA and the vegetation resources of the proposed ACEC. Impacts from overland travel and other ancillary construction areas (or road construction, if the area is released by Congress) would be minimized through design features and agency BMPs, including surveys and avoidance of special status species and RVA habitat, as well as reclamation and monitoring activities.

The 2-mile transmission line corridor would encompass portions of the White River Riparian (White River FO) and Badger Wash (Grand Junction FO) ACECs. Approximately 143 acres of the proposed 2-mile transmission line corridor would fall within the 590-acre White River Riparian ACEC. This would comprise 15 percent of the ACEC. The ACEC is a ROW avoidance area. Construction of roads within the ACEC would have potential impacts to the riparian areas and bald eagle roosts for which the ACEC was designated. All surface disturbances would be contingent upon avoidance of cottonwood communities, maintenance of utility as bald eagle habitat and properly functioning riparian community, and use of special reclamation techniques to accelerate recovery and reestablishment of habitat (BLM 1997). Adherence to

agency timing stipulations within a 0.5 mile buffer around roosts from November 15 to April 15 would minimize impacts to roosting eagles. TransWest commitments for BMPs to control erosion and sedimentation would further reduce impacts from overland construction and other disturbance. Approximately 310 acres of the proposed 2-mile transmission line corridor would fall within 1,520-acre Badger Wash ACEC. This would comprise 20 percent of the ACEC, and the area would not be within the portion of the ACEC that has been designated as a utility corridor. Application of **SDA-1**, which would restrict access to existing roads within all SDAs, would eliminate impacts to the sensitive plant species and to the portion of the ACEC used for hydrologic study and has been designated as unsuitable for public utilities.

Within the Grand Junction FO, approximately 1 mile (15 acres) of the 250-foot-wide transmission line ROW would pass through the 21,050-acre Demaree WSA. This would comprise less than 0.1 percent of the SDA. The 250-foot-wide transmission line ROW would be located within a designated utility corridor; however the corridor is located partially within the WSA, which is a ROW exclusion area. Transmission line development within the WSA would not be in conformance with WSA management. TransWest's commitment to comply with agency stipulations (TWE-1) would entail siting the 250-foot-wide transmission line ROW outside of the WSA. Approximately 1,812-acres of the 2-mile transmission line corridor would be located within the WSA (9 percent of the ACEC). The Demaree WSA is a ROW exclusion area; access road development within the WSA would not be in conformance with WSA management. Application of **SDA-1,** which would restrict access to existing roads within all SDAs, would eliminate impacts to the WSA from road construction. The BLM Grand Junction RMP has recommended that the Demaree WSA not be carried forward as wilderness because of the loss of high potential oil and gas lands and coal deposits. If the area is released from wilderness consideration, the area would be managed as part of a coal-emphasis management area and designated as a ROW sensitive area. Development of a transmission line and access roads would not be incompatible with proposed management direction. Impacts from overland travel and other ancillary construction areas (or road construction, if the area is released by Congress) would be minimized through design features and agency BMPs, including surveys and avoidance of special status species and RVA habitat, as well as reclamation and monitoring activities.

Approximately 1,925 acres of the proposed 2-mile transmission line corridor would fall within the 123,400-acre McInnis Canyons NCA. This would be approximately 2 percent of the NCA and would be entirely within a designated utility corridor. Development of roads would be consistent with area management, subject to agency constraints and BMPs to protect sensitive resources.

USFS IRAs and URUD Areas

The 250-foot-wide transmission line ROW for Alternative II-B would cross 1 mile (35 acres) of the Sanpitch URUD area. Impacts to this area would be the same as for Alternative II-A but with 25 additional acres.

Under Alternative II-B, portions of the 2-mile transmission line corridor would fall within four IRA/URUD areas. Within the Fishlake National Forest, approximately 191 acres of the proposed 2-mile transmission line corridor would fall within the Oak Creek URUD area, 13 acres of which also are within the Oak Creek IRA. Within the Manti-La Sal National Forest, the 2-mile transmission line corridor would encompass 4,578 acres of the Boulger-Black Canyon, East Mountain, and Sanpitch IRAs, and 4,294 acres of the Boulger-Black Canyon, East Mountain, and Sanpitch URUD areas. Application of **SDA-1** (avoidance of road construction in SDAs) and adherence to the Roadless Rule as described in **Appendices C** and **D** would eliminate any new road construction within the IRA. Application of **SDA-6** (application of roadless construction techniques within URUD areas; see Alternative II-A) would eliminate all portions of the 2-mile transmission line corridor within URUD areas from use for access roads or staging areas. This would eliminate potential impacts to wilderness qualities except for the visual impacts described above and would allow the Manti-La Sal National Forest to continue to consider these URUD areas for IRA and/or wilderness designation when they complete their LRMP revision. Consistency with ROS designations within the 2-mile transmission line corridor are discussed in Section 3.13, Recreation. Impacts to wildlife, vegetation, and

water resources within IRAs from roadless construction techniques are discussed under the applicable resource section.

Other Federally Managed SDAs and National Trails

Alternative II-B would not cross any SDAs managed by other federal agencies, but would cross the Old Spanish NHT four times (see **Figure 3.15-11**); twice within the Book Cliffs AU (Moab FO) and twice within the San Rafael Swell AU (Price FO). The crossings all would be located on BLM land. Alternative II-B would cross the Old Spanish NHT in the following four locations.

- Forty miles east of the town of Green River (Book Cliffs AU) and less than 3 miles west of Cisco. The crossing would be adjacent to I-70 on the north side of the highway. The segments are rated as NHT V, and do not contribute to the trail's NHT status. The crossing would be in a SQRU with a score of 9.5 (Class C). There are no associated historic sites, recreation areas, or interpretive features located near trail segments in this area. The Thompson Springs rest area would be located about 18 miles to the west of the crossing. The trail crossing would be located on BLM land within a designated utility corridor.
- One mile east of the town of Green River (Book Cliffs AU). The crossing would be adjacent to I-70 in an area where the trail parallels a frontage road to the north of the highway. There are no associated historic sites or interpretive features located near trail segments in this area. The Crescent Junction rest stop would be located about 9 miles to the west. The portion of I-70 adjacent to the segments is part of the Dinosaur Diamond Prehistoric Byway. The proposed trail crossing would be located on BLM land within a designated utility corridor. The segment is rated as NHT II, and contributes to the trail's NHT status. The crossings would be in a SQRU with a score of 11.5 (Class B).
- Two sites, approximately 7 and 8 miles north of the town of Green River (San Rafael Swell AU). The two segment of trail that would be crossed in this area are located less than 2 miles west of Highway 6, are part of The Green River Crossing to Big Flat Segment, are rated as NHT III and V, and do not contribute to the trail's NHT status. The crossings would be in SQRUs with scores of less than 7 (Class C). There are no associated historic sites, recreation areas, or interpretive features located near trail segments in this area (the watering places are located further to the north).

All trail crossing would be in compliance with the BLM Moab and Price RMP stipulations as they are located within a designated utility corridor. Towers would be placed to avoid surface disturbance near the actual trail.

Alternative II-B would be visible from the Old Spanish NHT for approximately 58 miles of the trail. Of those 58 miles, approximately 7 miles of trail (4 segments) are categorized as NHT-II; approximately 6 miles of trail segments are categorized as NHT-III; approximately 27 miles of trail segments are categorized as NHT-IV; and, approximately 18 miles are categorized as NHT-V. All segments are considered to be High Potential. Three of the 10 trail segments that are within the viewshed contribute to the trail's NHT status.

Table 3.15-11 summarizes key features of trail segments that would be in the Alternative II-B viewshed.

Table 3.15-11 Alternative II-B Viewshed Impacts by Old Spanish NHT Analysis Unit

AU	Segment Rating	Number of Segments	Contributing Status	Miles of Trail within Viewshed[1]	Total Mileage within AU	Percentage of AU within Viewshed
Book Cliffs (Moab FO; 62 miles total)	Highest rating within AU (NHT-II and exceptional)	2	1 contributing segment	6.5	11	59
	Remaining mileage (NHT-III and IV; high potential)	5	No contributing segments [2]	40	51	78

Table 3.15-11 Alternative II-B Viewshed Impacts by Old Spanish NHT Analysis Unit

AU	Segment Rating	Number of Segments	Contributing Status	Miles of Trail within Viewshed[1]	Total Mileage within AU	Percentage of AU within Viewshed
Blue Hills (Moab FO; 13 miles total)	Highest rating within AU (NHT-II; exceptional/ notable)	1	1 contributing segment	0.6	3	20
	Remaining mileage (NHT-III and IV; high potential)	2	1 contributing segment	0.7	10	7
San Rafael Swell (Price FO; 58 miles total)	Highest rating within AU (NHT-II; notable)	1	1 contributing segment	0.2	15	1
	Remaining mileage (NHT III, IV-VI; high potential)	3	No contributing segments	11	43	16

[1] Visibility of Alternative II-B from the historic trail is based on the 5-mile viewshed.

[2] Two segments not evaluated.

Within the Moab FO, Alternative II-B would have impacts within the Book Cliffs and Blue Hills AUs. Within the Book Cliffs AU, selection of Alternative II-B would result in visual impacts to about 47 miles (75 percent) of the 62 miles of inventoried trail within the AU. This includes 6.5 miles of trail that is rated as NHT-II/Exceptional (59 percent of the highest rated mileage within the AU). The remaining 40 miles of inventoried trail within the viewshed comprises trail segments that are considered to be High Potential. Affected mileage constitutes 78 percent of High Potential segments within the AU. Two of the 7 trail segments within the viewshed contribute to the trail's NHT status.

The far eastern portion of the Book Cliffs AU, which currently has a scenic rating of 14 (Class B), would not be in the transmission line viewshed.

The central and western portions of the Book Cliffs AU would be in the transmission line viewshed. Within the central portion, the integrity of historic setting of the trail is already diminished where it is adjacent to I-70 and railroad features, and there are no associated historic sites located near affected trail segments in this area (AECOM 2012) The SQRU rating of Class C in this portion of the AU would not change if Alternative II-B were to be constructed.

The western portion of Book Cliffs AU is located along I-70 west of Highway 191. Integrity of historic setting is retained in the west sections of this AU (especially along the northern portion) and scenic quality is average (Class B, with an SQRU score of 11.5), resulting in an overall rating of SI in northern segment. Selection of Alternative II-B would result in a 4 point reduction in the SQRU score, resulting in a reduction of scenic quality (to Class C, with a score of 7.5) in this portion of the AU. The overall rating of trail segments in this portion of the AU (which is currently SI) would be reduced to an SII.

Recreationally important landscapes within the Book Cliffs AU include the Cisco Desert area and the Green River area. Several recreation areas (the Thompson Springs rest stop, the hiking trail near Thompson Springs, the Crescent Junction rest stop, portions of the Dinosaur Diamond Prehistoric Byway and northernmost portions of the Labyrinth Canyon SRMA) would be within immediate foreground (0.0 to 0.5-mile) visibility of the transmission line. Impacts would not be mitigated by transmission line siting adjustments within the 2-mile transmission line corridor because the transmission line would still parallel the trail. None of these recreational areas currently offer interpretive materials related to the Old Spanish NHT.

Within the Blue Hills AU, selection of Alternative II-B would result in visual impacts to about 1 mile (10 percent) of the 13 miles of inventoried trail within the AU. This would include 0.6 mile of trail that is rated as NHT-II/Exceptional-Notable (20 percent of the highest rated mileage within the AU). The remaining affected mileage would be comprised of trail segments that are considered to be High Potential. Affected mileage would constitute 7 percent of High Potential segments within the AU. Two of the three trail segments within the viewshed contribute to the NHT status of the trail.

There are no associated historic sites located near affected trail segments in this area. The transmission line would be visible in the portions of the AU closest to the I-70 corridor; however, the scenic quality classification (Class B) would not change. Two nearby recreation areas (the northern edge of the Labyrinth Canyon SRMA and portions of the Dinosaur Diamond Prehistoric Byway) would be within immediate foreground (0.0 to 0.5-mile) visibility of the transmission line. Neither of these areas currently offer interpretive materials related to the Old Spanish NHT. Impacts would not be mitigated by transmission line siting adjustments within the 2-mile transmission line corridor because the transmission line would still be within the viewshed of this portion of the AU.

Within the Price FO, selection of Alternative II-B would result in visual impacts to about 11 miles (20 percent) of the 58 miles of inventoried trail within the AU. This includes 0.2 mile of trail that is rated as NHT-II/Notable (1 percent of the highest rated mileage within the AU). The remaining affected mileage would be comprised of trail segments that are considered to be High Potential. Affected mileage constitutes 16 percent of High Potential segments within the AU. One of the four trail segments within the viewshed contributes to the trail's NHT status. Impacts would be confined to segments closest to the Highway 6 corridor. This includes some of the higher rated trail segments within the Price FO, but would not include nearby associated historic sites, and current scenic quality classifications (Class B) would not change. Relocation of the transmission line to the easternmost portion of the 2-mile transmission line corridor could result in fewer visual impacts to these trail segments.

Once the final route is selected, an intensive Class III inventory and in-depth visual analysis would be conducted to determine the impact to contributing Old Spanish NHT segments crossed by the route or from which the route would be visible. If a contributing segment would be adversely affected, the effects would be minimized or mitigated onsite or offsite as stipulated in the Cultural Resources PA developed for the Project and through implementation of design features and BMPs in concert with the Trail Study Agency and the Wyoming BLM National Trails Management Program Lead. Mitigation identified in Section 3.12, Visual Resources includes measures to reduce visual impacts through the use of BLM environmental colors and location of structures, roads, and other project elements as far back from road, trail, and river crossings as possible, and, where feasible, employ terrain and vegetation to screen views from crossings.

<u>Alternative II-C</u>

Under Alternative II-C, the 250-foot-wide transmission line ROW would pass through the Oil Spring Mountain WSA/ACEC, the Demaree WSA, and the Browns Hole URUD area. Portions of the 2-mile transmission line corridor in which roads or construction support areas could be located also would cross one NCA, four additional ACECS, and five additional IRA/URUD areas.

BLM SDAs and National Landscape Conservation System Lands

Under Alternative II-C, the 250-foot-wide transmission line ROW would pass through the Demaree WSA and Oil Spring Mountain WSA/ACEC). Impacts to each of the SDAs would be the same as discussed under Alternative II-B and would be mitigated by application of **SDA-1**.

The 2-mile transmission line corridor would encompass portions of the McInnis Canyons NCA; and the White River Riparian, Badger Wash, San Rafael Canyon ACECs; and the Dry Wash/Molen Seep units of the Rock Art ACEC. Impacts to the McInnis Canyons NCA, the White River Riparian ACEC, and Badger Wash ACEC would be the same as under Alternative II-B.

Within the Price FO, portions of the 2-mile transmission line corridor would pass through the San Rafael Canyon ACEC and the Dry Wash and Molen Seep units of the Rock Art ACEC.

Within the Price FO, approximately 1,192 acres of the proposed 2-mile transmission line corridor would fall within the 15,200 San Rafael Canyon ACEC. This would comprise about 8 percent of the ACEC (the 250-foot-wide transmission line ROW would be co-located with existing steel lattice transmission lines

outside of the ACEC and would comply with BLM VRM for the area; see Section 3.12, Visual Resources). The ACEC is designated for scenic values and managed as a ROW avoidance area, excluded from land treatments unless used to protect or improve riparian values. OHV use is limited to designated roads. TransWest commitments to avoid riparian areas would reduce impacts to ACEC values; however the development of roads would reduce the scenic qualities for which the ACEC was designated. Application of **SDA-1** would eliminate these impacts. If road development could not be avoided within the full 1,192 acres, application of **SDA-2** (full reclamation of roads) would reduce the long term impacts of road development. Portions of the 2-mile transmission line corridor would also pass through the Dry Wash and Molen Seep units of the Rock Art ACEC. The Rock Art ACEC is a regionally important area with some of the best examples of prehistoric rock art in the Colorado Plateau. The ACEC is managed to protect cultural resource values and is designated as a ROW exclusion area outside of designated utility corridors. Approximately 143 acres of the proposed 2-mile transmission line corridor would be located within the 1,137-acre Dry Wash unit; and the 2-mile transmission line corridor would encompass the entire 634-acre Molen Seep unit. These areas would not be located within existing utility corridors. Development of roads would not be in conformance with area management objectives and could result in destruction of cultural resources as well as increased vandalism due to increased access. Application of **SDA-1** would eliminate these impacts.

USFS IRAS and URUD Areas

Within the Fishlake National Forest, approximately 7 miles of the 250-foot-wide transmission line ROW would cross the 8,212-acre Browns Hole URUD area. Use of a full 250-foot-wide transmission line ROW would result in up to 198 acres of vegetation removal within the URUD (2 percent of the 8,212-acre URUD). There is no specific management restriction precluding road development in URUD areas outside of IRAs, provided the appropriate Standard and Guidelines are met. As a result, these areas could be subject to access road and support facility development that would result in surface disturbance and/or vegetation removal within the 198-acre area, with concomitant impacts to wildlife habitat, opportunities for solitude and primitive recreation, and wilderness character. There would be 5,230 acres of the URUD area within the 2-mile transmission line corridor. These areas also could be used for access road and construction staging areas and represent the general area in which noise and human activity could affect wildlife or opportunities for solitude.

Within the Browns Hole URUD area, natural integrity has been affected by fire suppression, invasive species, and overgrazing; undeveloped character has been affected from roads and motorized routes. There are opportunities for primitive recreation, but not necessarily solitude due to the relatively small size of the URUD area and motorized routes and sights and sounds of Fishlake Basin. Manageability is affected by cherry-stemmed roads and motorized trails. Overall, the impacts associated with construction, operation, and maintenance would result in a permanent loss of acreage where the 250-foot-wide transmission line ROW would cross the URUD area and where access roads and staging areas would be located. The reference line would pass through the middle of the URUD area, essentially bisecting it into two URUD areas that are both less than the requisite 5,000 acres, further affecting the ability of this area to be managed as potential IRA or wilderness area. Additionally, the location of the transmission line would diminish the natural appearance and undeveloped character of a large portion of the URUD area due to its location in the center of the URUD area.

Application of **SDA-6** (application of roadless construction techniques within URUD areas; see Alternative II-A) would reduce the width of the ROW to less than 100 feet. This would reduce the area of potential surface impact to about 79 acres. Application of **SDA-6** also would eliminate all portions of the 2-mile transmission line corridor within the URUD area from use for access roads or staging areas. This would reduce impacts to wilderness qualities; however, the placement of the transmission line in the middle of this small URUD area would still result in adverse impacts to the natural integrity/appearance and opportunities for solitude and primitive recreation over a large part of the URUD area and would further lower the manageability of this area.

Portions of the 2-mile transmission line corridor would fall within five additional IRA/URUD areas. Within the Fishlake National Forest, approximately 2,050 acres of the 2-mile transmission line corridor would fall within the North Pavant URUD area, 1,257 acres of which are also within the North Pavant IRA. The 2-mile transmission line corridor would encompass 4,064 acres of the Moroni Peak, Mount Terrill, Oak Ridge, and The Rocks URUD areas. None of this acreage is within an IRA. Application of **SDA-1** and adherence to the Roadless Rule as described in the **Appendices C** and **D** would eliminate any new road construction within the North Pavant IRA. Application of **SDA-6** (application of roadless construction techniques within URUD areas, see Alternative II-A) would eliminate all portions of the 2-mile transmission line corridor within URUD areas from use for access roads or staging areas. Consistency with ROS designations within the 2-mile transmission line corridor are discussed in Section 3.13, Recreation.

Other Federally Managed SDAs and National Trails

Alternative II-C would not cross any SDAs managed by other federal agencies but would cross the Old Spanish NHT a total of nine times; five times on BLM lands (twice within the Book Cliffs AU and three times within the San Rafael Swell AU); and four times on NFS lands within the Manti La Sal National Forest.

The two Book Cliffs AU crossings and two of the three San Rafael Swell AU crossings would be the same as under Alternative II-B. Impacts would be identical to those identified under Alternative II-B. The third crossing within the San Rafael Swell AU would be located 14 miles east of Castle Dale and adjacent to CR 401. The proposed trail crossing would be located on BLM land and would be within a designated utility corridor. The trail segment that would be crossed is rated as NHT-V and does not contribute to the trail's NHT status. Towers would be placed to avoid surface disturbance near the actual trail.

Alternative II-C also would cross trail segments within the Fishlake National Forest. These crossings would be located south of I-70 about 20 miles southwest of Salina, near the Gooseberry/Fremont Rd. Scenic Backway. These segments were not evaluated as part of the 2012 NHT Inventory Report for NHT Condition Category, scenic quality, or overall setting.

Alternative II-C would be visible from the Old Spanish NHT for approximately 107 miles of the trail. Of those 107 miles, approximately 17 miles of trail segments are categorized at NHT II; approximately 8 miles of trail segments are categorized at NHT III; approximately 31 miles of trail segments are categorized as NHT IV; and, approximately 27 miles are categorized at NHT V. There would also be 24 miles within the Manti- La Sal National Forest that are unevaluated. **Table 3.15-12** summarizes key features of trail segments that would be in the Alternative II-C viewshed.

Table 3.15-12 Alternative II-C Viewshed Impacts by Old Spanish NHT Analysis Unit

AU (Location)	Segment Rating	Number of Segments	Contributing Status	Miles of Trail within Viewshed[1]	Total Mileage within AU	Percentage of AU within viewshed
Book Cliffs (Moab FO; 62 miles total)	Highest rating within AU (NHT-II; exceptional)	2	1 contributing segment	6.5	11	59
	Remaining mileage	5	No contributing segments[2]	40	51	78
Blue Hills (Moab FO; 13 miles total)	Highest rating within AU (NHT-II; exceptional)	1	1 contributing segment	0.6	3	20
	Remaining mileage	2	1 contributing segment	0.7	10	7
San Rafael Swell (Price FO; 58 miles total)	Highest rating within AU (NHT-II; notable)	1	1 contributing segment	10	15	67
	Remaining mileage	4	No contributing segments	26	43	60
Fishlake National Forest/Private	N/A	N/A	Unknown	24	N/A	N/A

[1] Visibility of Alternative II-B from the historic trail is based on the 5-mile viewshed.

[2] Two segments not evaluated

Within the Moab FO, selection of Alternative II-C would result in the same viewshed impacts to the Book Cliffs and Blue Hills AUs as under Alternative II-B.

Within the Price FO, selection of Alternative II-C would result in viewshed impacts to about 36 miles (62 percent) of the 58 miles of inventoried trail within the San Rafael Swell AU. This would include 10 miles of trail that is rated as NHT-II/Notable (67 percent of the highest rated mileage within the AU). The remaining 26 miles comprises trail segments that are considered to be High Potential. Affected mileage constitutes 60 percent of High Potential segments within the AU. One of the five trail segments within the viewshed contributes to the overall trail's NHT status. Impacts would be confined to segments closest to the Highway 6 corridor. There are no associated historic sites located near affected trail segments in this area and the current scenic quality classifications (Class C) would not change.

Alternative II-C generally would parallel an existing transmission line in portions of the San Rafael Swell AU specific to Alternative II-C. Recreationally important landscapes include the Wedge Overlook, and the Little Cedar Mountain Recreation Area. The Wedge Road visitor station and the Little Cedar Mountain Recreation Area would be about 3 miles to the west of the trail crossing. Portions of the San Rafael Swell and Wedge Overlook/Buckhorn Dr. Scenic Backway would be within the immediate foreground (0.0 to 0.5-mile) visibility of the transmission line. None of these areas currently offer interpretive materials related to the Old Spanish NHT. Impacts would not be mitigated by transmission line siting adjustments within the 2-mile transmission line corridor because the transmission line would still be within the viewshed of this portion of the AU.

Within the Fishlake National Forest, Alternative II-C would be within the viewshed of 24 miles of unrated trail. There are no associated historic sites located near affected trail segments in this area. One recreational area that would be near or within the viewshed would be the Gooseberry/Fremont Road Scenic Backway. No scenic quality ratings are available for this area, but adjacent BLM SQRUs are rated as Class C. Impacts would not be mitigated by transmission line siting adjustments within the 2-mile transmission line corridor because the transmission line would still cross the trail at some point.

Once the final route is selected, an intensive Class III inventory and in-depth visual analysis would be conducted to determine the impact to contributing Old Spanish Trail segments crossed by the route or from which the route would be visible. If a contributing segment would be adversely affected, the effects would be minimized or mitigated onsite or offsite as stipulated in the Cultural Resources PA developed for the Project and through implementation of design features and BMPs in concert with the Trail Study Agency and the Wyoming BLM National Trails Management Program Lead. Mitigation identified in Section 3. 12, Visual Resources includes measures to reduce visual impacts through use of BLM environmental colors and location of structures, roads, and other project elements as far back from road, trail, and river crossings as possible, and where feasible, employ terrain and vegetation to screen views from crossings.

Alternative II-D

Under Alternative II-D, the 250-foot-wide transmission line ROW would pass through the Lower Green River ACEC, Lower Green River WSR, a portion of one IRA within the Ashley National Forest, and the Sanpitch URUD area in the Manti-LaSal National Forest. Portions of the 2-mile transmission line corridor in which roads or construction support areas could be located would cross two additional ACECS, one national monument, and six additional IRA/URUD areas.

BLM SDAs and National Landscape Conservation System Lands

Within the Vernal FO, approximately 1 mile of the 250-foot-wide transmission line ROW would cross the 8,470-acre Lower Green River ACEC. The area is managed as a ROW avoidance area for protection of riparian and special status species habitat and scenic values. During construction, up to 20 acres (0.3 percent of the ACEC) would be subject to vegetation removal and/or surface disturbance that could affect special status species habitat and scenic values. Agency buffers and TransWest's commitment to avoid riparian areas and special status species habitat would reduce impacts to riparian and special status plant species values; soil and water BMPs would reduce sedimentation that could affect special status

species fish. Visual impacts from a transmission line would not be in conformance with SDA management as Class II VRM (see Section 3.12 for more discussion about impacts to visual resources). Access roads and construction staging areas also could be constructed within the 1,239-acre portion of the 2-mile transmission line corridor located within the ACEC, further expanding the area potentially affected by vegetation removal and surface disturbance to approximately 15 percent of the ACEC. Application of **SDA-1** would eliminate these impacts. If road development could not be avoided within the full 1,239 acres, application of **SDA-2** (full reclamation of roads) would reduce the long term impacts of road development; however, the visual impacts from operation of the transmission line would be a permanent impact to the high value scenery of the ACEC.

Approximately 1 mile (19 acres) of the 250-foot-wide transmission line ROW would cross a 30-mile segment of the lower Green River. This segment is suitable for wild and scenic river designation (as “scenic”) and is also designated as a Class II VRM. The visual impacts from a transmission line would not be in conformance with SDA management as Class I and II VRM and would not be consistent with the criteria for a “scenic” designation (largely primitive and undeveloped, no substantial evidence of human activity, etc.). A one-time exception would be needed to change the VRM class to VRM III. Section 3.12, Visual Resources, provides additional information regarding the visual impacts to this area. Approximately 1,447-acres of the of the 2-mile transmission line corridor would be located within the 11,968 WSR area (12 percent of the suitable area). Application of **SDA-1** would eliminate road construction impacts to the WSR; however, the visual impacts from operation of the line would not be mitigated.

Approximately 489 acres of the proposed 2-mile transmission line corridor would fall within the 1,377-acre Lears Canyon ACEC. This would comprise about 35 percent of the ACEC. Lears Canyon is managed as a ROW avoidance area for protection of relict vegetation; it is closed to motorized travel and managed as VRM II. Application of **SDA-1** would eliminate road construction impacts to the ACEC. If road development could not be avoided within the full 489 acres, agency avoidance buffers and TransWest commitments for key species habitat avoidance would reduce the impacts of road development on the plant habitat for which the ACEC was designated.

Approximately 1,453 acres of the proposed 2-mile transmission line corridor would fall within the 74,302-acre Nine Mile Canyon ACEC. This would comprise about 2 percent of the ACEC, which is managed as a ROW avoidance area for protection of cultural resources and special status species. The corridor would be located above the rim of the canyon, which is managed as VRM III. Application of **SDA-1** would eliminate potential impacts to cultural resources within the ACEC. If road development could not be avoided within the full 1,453 acres, impacts to cultural resources would be mitigated through compliance with the draft PA. The Agency avoidance buffer and TransWest commitments for special status species habitat avoidance would reduce the impacts of road development on the plant habitat for which the ACEC was designated.

USFS IRAs and Unroaded/Undeveloped Areas

Within the Ashley National Forest, approximately 1 mile of the 250-foot-wide transmission line ROW would cross the 30,356-acre IRA 401009. This IRA has been rated as having moderate natural integrity/ appearance, some opportunities solitude and primitive recreation but less desirable due to terrain and excluded roads, no special features, and difficult to manage as wilderness (USFS 2008).

Use of a full 250-foot-wide transmission line ROW would result in up to 11 acres of vegetation removal within the IRA 401009 (less than 0.1 percent of the 9,349-acre IRA). The disturbances would be located on the southern edge of the IRA, along the tops of the southern plateaus (see **Figure 3.15-13**). There are several existing USFS roads in this portion of the IRA. Roadless construction methods (as identified in the PDTR, see **Appendix D**) would reduce the 250-foot-wide transmission line ROW to 100 feet (12 acres) and eliminate surface disturbance associated with new roads within the IRA. Manageability of IRA 401009 as a designated roadless area currently is rated as somewhat difficult due to edge effects, such as the presence of existing roads (see **Appendix H**). Placement of the transmission line along an area with existing access

roads would increase linear intrusions into the IRA, further lowering manageability. However, over 99 percent of the IRA would remain unfragmented and well over the requisite 5,000 acres.

IRA 401009 provides high value winter range for deer and elk, summer habitat for pronghorn, big game migration corridors, and contains greater sage-grouse broodrearing, occupied, and winter habitat. TransWest would be required to maintain agency-stipulated wildlife buffers and timing restrictions and would span sensitive resources such as threatened and endangered species habitat, cultural resources, wetlands, etc. (see **Appendix C** for a full list of design features). TransWest also would use selective vegetation removal whenever possible to reduce resource impacts. Helicopter construction would require the use of 7-acre helicopter fly yards located every five miles along the area where helicopter construction is planned; however, it is anticipated that these would be located outside of the IRA. Application of design features in **Appendix C**, specifically the development of vegetation and noxious weed management plans to address plant removal, selective clearing, and reclamation consistent with agency permitting stipulations for soils, water, vegetation and wildlife, also would reduce impacts to habitat and wildlife throughout the area. Reclamation areas would be monitored for 3 to 5 years in accordance with USFS requirements (see **Appendix D**). As a result, the limited amount of construction ground disturbance within IRA 401009 would not impact the diversity of plants and animals within the IRA. There are no impaired streams within the IRA. Water contributes to the Duchesne River instream flows and supplies spring and pond water for grazing. TransWest would use design features and BMPs to reduce sedimentation to protect water resources within the IRA.

Impacts to the IRA from transmission line operation would be similar to those described under Alternative II-A, and would be reduced through application of **SDA-4** (Class 2 or Class 3 vegetation maintenance options).

The existing landscape character of the IRA would be modified by the presence of the transmission line within the IRA; however, the route would be located in areas where existing man-made features such as grazing, vegetation treatments; oil and gas, and motorized activities have already affected wilderness character. Visual impacts and proposed mitigation are discussed in greater detail in Section 3.12. The IRA contains prehistoric sites show features that may be vision quest or ceremonial sites with religious or traditional cultural property significance. Impacts to any cultural resource sites would be mitigated per the PA (see Section 3.11, Cultural Resources). One acre of the full 250-foot-wide transmission line ROW located within the IRA would be within Semi-Primitive Motorized ROS areas. The sights and sounds of construction would not be fully consistent with management goals for this ROS designation (see Section 3.13, Recreation, for more information about impact to ROS areas from construction and operation of the transmission line).

Overall, the impacts associated with construction, operation, and maintenance would result in a permanent loss of acres where the Project would cross the IRA, which would diminish the natural appearance and undeveloped character of the westernmost portion of IRA #401009, However, the wilderness characteristics of the area have already been affected by existing man-made features present in the area, opportunities for solitude and primitive recreation are primarily in other portions of the IRA and changes in the wilderness qualities would not be large enough to preclude management of the majority of the area as an IRA and/or wilderness.

The 250-foot-wide transmission line ROW for Alternative II-D would cross 1 mile (11 acres) of the Sanpitch URUD area. Impacts to this area would be the same as for Alternative I-A.

Within the Ashley National Forest, the 2-mile transmission line corridor in which access roads or other construction support areas also could be located would encompass 4,113 acres of the IRA #401009, and 1,856 acres within the Alkali Canyon URUD area (which partially overlaps IRA #401009). Within the Manti-LaSal National Forest, the 2-mile transmission line corridor would encompass portions of the Nuck Woodward IRA/Nuck Woodward – Gentry Mountain URUD area, and the Oak Creek and Sanpitch IRA/URUD areas); within the Uinta National Forest, the 2-mile transmission line corridor would encompass

portions of the Hop Creek Ridge and Nephi IRAs (see **Table 3.15-8** and **Table 3.15-9**). Application of **SDA-1** (avoidance of road construction in SDAs) and adherence to the Roadless Rule as described in **Appendices C** and **D** would eliminate any new road construction within the IRA. Application of **SDA-5** (application of roadless construction techniques within URUD areas; see Alternative II-A) would eliminate all portions of the 2-mile transmission line corridor within URUD areas from use for access roads or staging areas. This would eliminate most potential impacts to wilderness qualities except for the visual impacts described above and would allow the Ashley National Forest to continue to consider these URUD areas for IRA and/or wilderness designation when they complete their LRMP revision.

Other Federally Managed SDAs and National Trails

Approximately 3 acres of the Dinosaur National Monument (less than 0.001 percent of the 210,000+-acre area) would be located within the 2-mile transmission line corridor. Application **of SDA-1** would eliminate impacts to the important geological and paleontological resources and native habitat within the designated area. There would be no impact to National Trails.

Alternative II-E

Under Alternative II-E, the 250-foot-wide transmission line ROW would cross approximately 8 miles of 5 IRAs/URUD areas located in 2 national forests. Portions of the 2-mile transmission line corridor in which roads or construction support areas could be located would cross 5 additional IRAs and 1 national monument.

BLM SDAs and National Landscape Conservation System Lands

Alternative II-E would not cross any lands within the National Landscape Conservation System (NCAs, WAs and WSAs, or WSRs), or BLM-designated ACECs.

USFS IRAs and URUD Areas

Under Alternative II-E, the 250-foot-wide transmission line ROW would cross approximately 8 miles of 5 IRA/URUD areas located in 2 national forests.

Within the Manti-La Sal National Forest, the 250-foot-wide transmission line ROW would cross 1 mile of the Cedar Knoll IRA/URUD area, 1 mile of the Coal Hollow IRA/URUD area, and 1 mile of the Sanpitch URUD area (but not the Sanpitch IRA). Additional portions of the 2-mile transmission corridor would also be located within the three IRA/URUDs (including the Sanpitch IRA). Construction and operation impacts to the Cedar Knoll, Coal Hollow IRA/URUD areas and the Sanpitch URUD area would be the same as those described under Alternative II-A, including the potential for two micro-siting options within the Cedar Knoll IRA/URUD area. Construction and operation impacts to the Sanpitch IRA area would be the same as those described under Alternative II-A.

Within the Ashley National Forest, the 250-foot-wide transmission line ROW would be located within an approximately 15-mile long, narrow canyon (Sowers Canyon) between IRA #401010/Sowers Canyon East URUD (to the east) and IRA #401011/Cottonwood Canyon URUD (to the west). The reference line and 250-foot-wide transmission line ROW would cross 3 miles of IRA 401010 (see **Figure 3.15-13**); the 250-foot-wide transmission line ROW (but not the reference line) would also encompass portion of IRA 401011. The route would follow an existing transmission line and a creek for the entire distance; a cherry stem road originating from the north also would be adjacent to the route for all but about 3 miles. The existing transmission line would not be within a designated utility corridor or window; the route was considered and recommended for designation during preparation of the forest management plan, but was never formally designated.

Both the IRA #401010/Sowers Canyon East URUD area and the IRA #401011/Cottonwood Canyon URUD area were rated has having moderate natural integrity/appearance due to grazing and vegetation treatment; oil and gas, and motorized activities; good opportunities for solitude and primitive recreation areas but only

outside of the boundary and excluded roads such as Sowers Canyon Road; no special features; and difficult to manage as wilderness. The disturbances would be located western and eastern edges of IRA #401010 and IRA #40101, respectively (see **Figure 3.15-12**), keeping over 99.9 percent of the IRA and URUD area unfragmented and well over the requisite 5,000 acres. Impacts to manageability would be minimal in that the area is already difficult to manage due to the presence of existing linear facilities (Sowers Canyon Road and the existing transmission line).

Use of a full 250-foot-wide transmission line ROW would result in up to 133 acres of vegetation removal within the IRA #401010 (117 acres of which would also be within the Sowers Canyon East URUD area) and 36 acres within the IRA #401011/Cottonwood Canyon URUD area. Roadless construction methods (as identified in the PDTR, see **Appendix D**) would be utilized within IRAs to ensure compliance with the Roadless Rule. These include use of helicopters for tower placement, use of existing roads, and overland travel. Application of the roadless construction techniques would reduce the ROW within the IRA #401010 and IRA #401011 to about 67 acres and would eliminate the surface disturbance associated with new roads. However, requisite separation distances from the existing transmission line could result in the 250-foot-wide transmission line ROW being located on steeper side slopes, resulting in increased potential for erosion and sedimentation. There is one impaired stream that would be located near the 250-foot-wide transmission line ROW (Sowers Creek). Water contributes to the Duchesne River instream flows and supplies spring and pond water for grazing. TransWest would use Design Features and BMPs to reduce sedimentation to protect water resources within the IRA.

Both IRA/URUD areas provide high value winter range for deer and elk, summer habitat for pronghorn, big game migration corridors, and contain Greater sage grouse broodrearing, occupied, and winter habitat. TransWest would be required to maintain agency-stipulated wildlife buffers and timing restrictions and would span sensitive resources (such as threatened and endangered species habitat, cultural resources, wetlands, etc.; see **Appendix C** for a full list of design features). TransWest also would use selective vegetation removal whenever possible to reduce resource impacts. Helicopter construction would require the use of 7-acre helicopter fly yards located every five miles along the area where helicopter construction is planned; however, it is anticipated that these would be located outside of the IRA. Application of design features in **Appendix C**, specifically the development of vegetation and noxious weed management plans to address plant removal, selective clearing, and reclamation consistent with agency permitting stipulations for soils, water, vegetation and wildlife, would also reduce impacts to habitat and wildlife throughout the area. Reclamation areas would be monitored for 3 to 5 years in accordance with USFS requirements (see **Appendix D**). As a result, the limited amount of construction ground disturbance within the IRA would not impact the diversity of plants and animals within the IRA.

Impacts to the IRA #401010 and IRA #401011 from transmission line operation would be similar to those described under Alternative II-A, and would be reduced through application of **SDA-4** (Class 2 or Class 3 vegetation maintenance options).

The existing landscape character of the IRAs would be modified by the presence of the transmission line; however, the route would be located in areas where existing man-made features such as linear facilities, grazing, vegetation treatments, oil and gas, and motorized activities have already affected wilderness character. Visual impacts and proposed mitigation are discussed in greater detail in Section 3.12, Visual Resources.

Cultural surveys within the IRA show both historic and prehistoric activity in the area. Impacts to any cultural resource sites would be mitigated per the PA (see Section 3.11, Cultural Resources and Native American Concerns). Within the IRA/URUD areas, the 250-foot-wide transmission line ROW would be fully in areas designated as roaded natural ROS. These types of areas are managed to allow for readily evident to moderate evidence of sights and sounds of human activity. The sights and sounds of construction would be consistent with ROS designations for this area (see Section 3.13 Recreation, for more information; visual impacts to IRAs from construction of the transmission line are discussed in Section 3.12).

Overall, the impacts associated with construction, operation, and maintenance would result in a permanent loss of acres where the Project would cross the IRAs that would diminish the natural appearance and undeveloped character of the edges of IRA #401010/Sowers Canyon East URUD area and IRA #401011/Cottonwood Canyon URUD area. However, the wilderness characteristics of the area have already been affected by existing man-made features and linear facilities present in the area, and opportunities for solitude and primitive recreation are primarily in other portions of the IRA. Any changes in the wilderness qualities would not be large enough to preclude management of the overall area as an IRA and/or wilderness beyond existing conditions.

The 2-mile transmission line corridor would encompass additional portions of IRA #401010/Sowers Canyon East URUD area, IRA #401011/Cottonwood Canyon URUD area, as well as portions of five IRAs within the Uinta National Forest (see **Table 3.15-8** through **3.15-9**). Access road construction within IRAs would not be in conformance with area management plans. Application of **SDA-1** (avoidance of new road construction in SDAs) and adherence to the Roadless Rule as described in **Appendices C** and **D** would eliminate IRAs from use for access roads. Roadless construction methods (as identified in the PDTR, see **Appendix D**) would be utilized to ensure compliance with the Roadless Rule. These methods include use of helicopters for tower placement, use of existing roads, and overland travel. Application of **SDA-6** (application of roadless construction techniques within URUD areas; see Alternative II-A) would eliminate all portions of the 2-mile transmission line corridor within URUD areas from use for access roads or staging areas. This would eliminate most potential impacts to wilderness qualities except for the visual impacts described above, and it would allow the Ashley National Forest to continue to consider these URUD areas for IRA and/or wilderness designation when they complete their LRMP revision. Consistency with ROS designations within the 2-mile transmission line corridor are discussed in Section 3.13, Recreation. Impacts to wildlife, vegetation, and water resources within IRAs from roadless construction techniques are discussed under the applicable resource sections.

Other Federally managed SDAs

Impacts to the Dinosaur National Monument would be the same as under Alternative II-D.

Alternative II-F (Agency Preferred)

Under Alternative II-F, the 250-foot-wide transmission line ROW would pass through the Lower Green River ACEC, Lower Green River WSR, two IRA/URUD areas within the Ashley National Forest, three IRA/URUD areas within the Manti-La Sal National Forest, and one IR in the Uinta National Forest. Portions of the 2-mile transmission line corridor also would cross two additional ACECs, two additional IRA/URUD areas within the Ashley National Forest, one additional IRA/URUD within the Fishlake National Forest, and five additional IRAs within the Uinta National Forest. Impacts are discussed below.

BLM SDAs and National Landscape Conservation System Lands

Portions of the reference line, 250-foot-wide transmission line ROW, and 2-mile transmission line corridor in which roads or construction support areas could be located would cross the Lower Green River ACEC, Lower Green River WSR, Lears Canyon ACEC, and Nine Mile Canyon ACEC. Impacts to each of these areas would be the same as under Alternative II-D.

USFS IRAs and Unroaded/Undeveloped Areas

Within the Ashley National Forest, impacts to IRA #401009/Alkali Canyon URUD area would be the same as under Alternative II-C. Within the Ashley National Forest, the 2-mile transmission line corridor in which access roads or other construction support areas also could be located would encompass acreage within IRA #401011, IRA #401012/First Canyon and Right Fork Indian Canyon URUD areas and IRA #401013/Mill Hollow URUD area (see **Tables 3.15-8** and **3.15-9**). Application of **SDA-1** (avoidance of road construction in SDAs) and adherence to the Roadless Rule as described in **Appendices C** and **D** would eliminate any new road construction within IRAs. Application of **SDA-5** (application of roadless construction techniques within URUD areas; see Alternative II-A) would eliminate all portions of the 2-mile transmission line corridor within

URUD areas from use for access roads or staging areas. This would eliminate most potential impacts to wilderness qualities within the URUD areas.

Within the Fishlake National Forest, impacts to the Oak Creek IRA/URUD area would be the same as under Alterative II-B.

Within the Manti-La Sal National Forest, impacts to Cedar Knoll and Coal Hollow IRA/URUD areas (including differences between the Cedar Knoll IRA micro-siting options) would be the same as under Alterative II-A. Impacts to the Sanpitch IRA/URUD area would be the same as under Alternative II-B.

Within the Uinta National Forest, approximately one mile of the 250-foot-wide transmission line ROW would cross the 6,850-acre Soldier Summit IRA. This IRA has been rated as having low to moderate natural integrity/appearance and opportunities solitude and primitive recreation; no special features; and low to moderate difficulty to manage as wilderness, primarily due to the IRA size (less than 10,000 acres), and number of intrusive cherry stems (USFS 2003). During construction, approximately 32 acres of the IRA (1 percent) would be subject to vegetation removal as well as the surface disturbance associated with placement of the transmission line. The route would be located on the southwestern edge of the IRA. There are several existing USFS roads in and near this IRA. Surface disturbance would be reduced through applicant-committed roadless construction methods (as identified in the PDTR, see **Appendix D**). This would reduce the ROW to about 13 acres and eliminate surface disturbance associated with new roads within the IRA.

IRA manageability is currently rated as somewhat difficult dues to edge effects (see **Appendix H**). Placement of the transmission line along an area with existing access roads would increase edge effects, further lowering manageability. However, over 99 percent of the IRA would remain unfragmented and still over the requisite 5,000 acres. The Soldier Summit IRA provides summer range (and some winter range) for deer and elk herds as well as habitat for a variety of other game and non-game species. TransWest would be required to maintain agency-stipulated wildlife buffers and timing restrictions and would span sensitive resources (such as threatened and endangered species habitat, cultural resources, wetlands, etc.; see **Appendix C** for a full list of design features). TransWest also would use selective vegetation removal whenever possible to reduce resource impacts. Helicopter construction would require the use of 7-acre helicopter fly yards located every 5 miles along the area where helicopter construction is planned; however, it is anticipated that these would be located outside of the IRA. Application of design features in **Appendix C**, specifically the development of vegetation and noxious weed management plans to address plant removal, selective clearing, and reclamation consistent with agency permitting stipulations for soils, water, vegetation and wildlife, also would reduce impacts to habitat and wildlife throughout the area. Reclamation areas would be monitored for three to five years in accordance with USFS requirements (see **Appendix D**). As a result, the limited amount of construction ground disturbance within the IRA would not impact the diversity of plants and animals within the IRA. The IRA contains two points of water diversion for municipal purposes. TransWest would use design features and BMPs to reduce sedimentation to protect water resources within the IRA.

Within the Uinta National Forest, the 2-mile transmission line corridor in which access roads or other construction support areas also could be located would encompass acreage within the Diamond Fork, Golden Ridge, Hop Creek Ridge, Nephi, and Tie Fork IRAs. Impacts would be the same as under Alternative II-E and similar to those discussed under Alternative II-A.

<u>Alternative Variation in Region II</u>

Emma Park Alternative Variation

There would be no changes to impacts to BLM SDAs under the Emma Park alternative variation, as neither the variation nor the segments that the variation would replace include any BLM SDAs.

Selection of the Emma Park alternative variation would eliminate the disturbances within NFS SDAs that would occur if the segments that the variation would replace are selected.

The eliminated NFS SDA disturbance would be within three IRAs and URUD areas in the Ashley National Forest (IRA #401011/Cottonwood Canyon URUD area; IRA #401012/First Canyon-Right Hand Indian Canyon URUD area; and IRA #401013/Mill Hollow URUD area) and one IRA within the Uinta National Forest (IRA #418019, Soldier Summit).

Alternative Connectors in Region II

There would be no impacts to SDAs from the 250-foot-wide transmission line ROW for any of the Lynndyl, IPP East, Castle Dale, Highway 191, or Price alternative connectors.

Approximately 6 acres of the 2-mile corridor for the Lynndyl connector would be within the Oak Creek IRA. Application of **SDA-1** and adherence to the Roadless Rule as described in the **Appendices C** and **D** would eliminate all new road construction within the IRA. The 2-mile corridor would not cross any SDA under any of the other alternative connectors.

Region II Conclusions

Alternatives II-A and II-E would have no impacts to BLM SDAs and National Landscape Conservation System Lands. Alternatives II-B and II-C primarily would affect BLM SDAs and National Landscape Conservation System Lands in Colorado; Alternatives II-D and II-F would affect BLM SDAs and National Landscape Conservation System Lands in Utah. Alternatives II-B and II-C also would have fewer miles of reference line within these SDAs than Alternatives II-D and II-F, and use would be more compatible with the SDA management (under Alternatives II-B and II-C, the reference line mileage within the Demaree WSA would be within a designated utility corridor and would be laid out to avoid the WSA, whereas under Alternatives II-D and II-F, the reference line mileage within the Lower Green River ACEC and the Lower Green River WSR would cross a ROW avoidance area, would not be consistent with the criteria for a “scenic” designation, and would require a one-time exception to change the VRM class).

Alternative II-B would have the least impacts to USFS SDAs. No reference line mileage within IRAs or URUD areas, and use of roadless construction and mitigation would avoid impacts to the portions of the four IRA/URUD areas that would be within the 2-mile transmission line corridor. Alternatives II-D and II-F would have the next lowest impacts to USFS SDAs (with 1 and 3 miles, respectively, within IRAs with design features and mitigation such that the manageability of the IRAs would not be expected to appreciably change). Alternative II-E would contain the most mileage within IRAs (5 miles); however, design features and mitigation also would reduce impacts to the degree that manageability of the IRAs would not be expected to appreciably change. Alternative II-A would have about 4 miles within IRAs. Impacts would include changes to wilderness character and manageability in a small portion of the IRA. Micro-siting options may reduce mileage, but could make manageability of the IRA more difficult. Alternative II-C would affect the least number of IRAs; however, the placement of 7 miles of reference line within an URUD area would result in changes to wilderness character of the entire URUD area and could preclude the ability to manage this area as IRA/wilderness.

Alternatives II-A, II-D, II-E, and II-F would have no impacts to NHTs. Alternative II-B and II-C both would equally affect Old Spanish NHT segments along I-70 and near the town of Green River (Book Cliffs AU and the southeast portion of the San Rafael Swell AU), lowering the scenic and overall ratings of the western portion of the Book Cliffs AU (from Class B to Class C, and from SI to SII). No historic sites or interpretive sites would be affected by the presence of the transmission line. Alternative II-C would have the greatest impacts on the NHT, as it would cross the NHT five additional times (once within the western portion of the San Rafael Swell AU and the 4 times on USFS lands) and would have 49 more miles of trail within the transmission line viewshed than Alternative II-B.

3.15.4.5 Region III

Tables 3.15-13 through **3.15-16** provide a list of the SDAs that would be located within the Project corridors in Region III. These areas also are depicted in **Figures 3.15-3**, **3.15-7**, **3.15-12**, and **3.15-16**. The list of areas includes some that would be within the 2-mile corridor, but outside of the 250-foot-wide transmission line ROW.

Table 3.15-13 Region III: BLM Special Designation Areas within 250-foot-wide Transmission Line ROW and 2-Mile Transmission Line Corridor

Land Management Agency	Special Designation Area	Alternative III-A 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-B 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-C 250-foot ROW miles/acres 2-mile corridor acres
BLM St. George FO, Utah	Beaver Dam Wash NCA	4/117 7,575	N/A	N/A
	Beaver Dam Slope ACEC	9/278 12,350	N/A	N/A
BLM Caliente FO, Nevada	Mormon Mesa-Ely ACEC (Caliente FO)	10/290 10,720	9/265 10,615	N/A
	Beaver Dam Slope ACEC (Caliente FO)	N/A	0/0 306	N/A
	Clover Mountains Wilderness	N/A	0/0 545	N/A
	Kane Springs ACEC (Caliente FO)	N/A	N/A	10/296 6,340
	Delamar Mountains Wilderness	N/A	N/A	0/0 2,697
BLM Las Vegas FO, Nevada	Mormon Mesa ACEC (LVFO)	8/234 6,550	15/441 12,580	N/A
	Coyote Springs Valley ACEC	N/A	N/A	19/563 24,327
	Arrow Canyon Wilderness	N/A	N/A	0/0 346
	Muddy River WSR	**1** crossing/**13** **213**	1 crossing/19 81	N/A
	Meadow Valley Wash WSR	**N/A**	1 crossing/19 374	N/A

Table 3.15-14 Region III: USFS IRAs within 250-foot-wide Transmission Line ROW and 2-Mile Transmission Line Corridor

Land Management Agency	IRAs	Alternative III-A 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-B 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-C 250-foot ROW miles/acres 2-mile corridor acres
Dixie National Forest[1]	Bull Valley IRA	0/0 313	N/A	N/A
	Moody Wash IRA	0/0 1,760	N/A	N/A
	Mogotsu IRA	0/0 3,734	N/A	N/A
	Atchinson IRA	2/45 3,229	N/A	N/A
	Cove Mountain IRA	0/0 5,067	N/A	N/A

Table 3.15-15 Region III: USFS URUD Areas Within 250-foot-wide Transmission Line ROW and 2-Mile Transmission Line Corridor

Land Management Agency	Unroaded/Undeveloped Areas	Alternative III-A 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-B 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-C 250-foot ROW miles/acres 2-mile corridor acres
Dixie National Forest[1]	Bull Valley	0/0 436	N/A	N/A
	Moody Wash/Mogotsu	0/0 6,181	N/A	N/A
	Atchinson	4/124 4,217	N/A	N/A
	Cove Mountain	0/0 5,060	N/A	N/A

Table 3.15-16 Region III: Other Federally Managed Special Designation Areas Within 250-foot-wide Transmission Line ROW and 2-Mile Transmission Line Corridor

Land Management Agency	Special Designation Area	Alternative III-A 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-B 250-foot ROW miles/acres 2-mile corridor acres	Alternative III-C 250-foot ROW miles/acres 2-mile corridor acres
USFWS, Nevada	Desert NWR	N/A	N/A	1/25 16,524
	Pahranagat NWR	N/A	N/A	0/0 170
	Fish & Wildlife Proposed Wilderness #1	N/A	N/A	0/0 3,317
	Fish & Wildlife Proposed Wilderness #2	N/A	N/A	0/0 5,313
	Fish & Wildlife Proposed Wilderness #3	N/A	N/A	0/0 5,428
	Unit 2 Las Vegas Range Proposed Wilderness	N/A	N/A	0/0 243
	Unit 3 Sheep Range Proposed Wilderness	N/A	N/A	0/0 4,522
BLM/NPS	Old Spanish NHT			
	Number of crossings and segment rating	3 segment crossed; 1 NHT-1, 2 unrated	No segments crossed	N/A
	Visibility of the alternative from the Old Spanish Trail	Visible along 10 miles of the trail, of which - 8 miles are NHT-I, 1.9 miles are NHT-II, and 0.1 mile of NHT-IV	Visible along 6 miles of the trail, of which 5 miles are NHT-I, 1 mile is NHT-II, and 0.1 mile is NHT-IV	N/A
	Associated Historic Sites and natural features, and nearby recreation or interpretive features	Meadow valley wash, Muddy river	None	N/A
	Management/Land Use	All crossing on BLM lands, within designated utility corridors	All crossing on BLM lands, within designated utility corridors	N/A

Alternative III-A (Applicant Proposed)

Under Alternative III-A, the 250-foot-wide transmission line ROW would cross the Beaver Dam Slope ACEC, the Beaver Dam Wash NCA (which is partially collocated with the Beaver Dam Slope ACEC), the Mormon Mesa and Mormon Mesa-Ely ACECs, the Muddy River WSR, one IRA/URUD area within the Dixie National Forest, and the Old Spanish NHT. Portions of the 2-mile transmission line corridor also would cross four additional IRA/URUD areas.

BLM SDAs and National Landscape Conservation System Lands

Within the St. George FO, Approximately 9 miles of the 250-foot-wide transmission line ROW would cross the 48,519-acre Beaver Dam Slope ACEC. For protection of critical desert tortoise habitat as well as other special status species habitat, the area is managed as a ROW avoidance area outside of designated corridors. The 250-foot-wide transmission line ROW would be entirely located within an existing designated utility corridor; therefore, it would be in conformance with management objectives. During construction, up to 278 acres (0.6 percent of the ACEC) would be subject to vegetation removal and/or surface disturbance that could affect desert tortoise or other special status species values. Agency buffers and TransWest's commitment to avoidance of special status habitat would reduce impacts to special status species values.

Approximately 12,350 acres of the of the 2-mile transmission line corridor would be located within the Beaver Dam Slope ACEC (25 percent of the ACEC). The designated utility corridor would not encompass the full width of the 2-mile transmission line corridor; approximately 4,520 acres would be located within ACEC ROW avoidance areas and an additional 2,520 acres would located in ROW avoidance areas common to both the ACEC and the Beaver Dam Wash NCA. Per the St. George RMP, new ROW and temporary use permits are strongly discouraged within the Beaver Dam Slope ACEC and shall only be authorized if no reasonable alternative exists and impacts to tortoises and their habitat can be mitigated. Surface disturbance (before restoration) resulting from all ROW in the ACECs shall not exceed 40 acres through the life of the project. Construction of unpaved roads could occur only if positive benefits to tortoise management would occur and would require concurrence from the USFWS. Paving would not be allowed. Speed limits exist within the ACEC. The St. George RMP contains numerous BMPs to reduce impacts including a desert tortoise mitigation plan with required surveys and monitoring, employee education, and other measures to reduce impacts to desert tortoise.

Application of **SDA-3** would limit impacts to the ACEC values from road construction and human activity to only those areas within the existing utility corridor; application of **SDA-2** (full road reclamation) would further reduce risk; however, initial vegetation removal and surface disturbance would still occur within the corridor. Adherence to agency stipulations and development of a desert tortoise mitigation plan would reduce impacts to desert tortoise within the corridor during construction.

Approximately 4 miles of the 250-foot-wide transmission line ROW would cross the 63,500-acre Beaver Dam Wash NCA. During construction, approximately 117 acres would be subject to vegetation removal and/or surface disturbance that could affect desert tortoise or other special status species habitat. This comprises 0.2 percent of the NCA. The 250-foot-wide transmission line ROW would be entirely located within an existing designated utility corridor, which is excluded from NCA management objectives. However, the NCA is largely collocated with the Beaver Dam Slope ACEC; therefore, it would be subject to the stipulation and requirements identified above for protection of the desert tortoise. Approximately 7,575 acres of the of the 2-mile transmission line corridor would be located within the NCA (12 percent of the NCA). The designated utility corridor would not encompass the full width of the 2-mile transmission line corridor; approximately 2,520 acres would be located within shared NCA/ACEC ROW avoidance areas and an additional 1,452 acres would be located in NCA-only ROW avoidance areas. Application of **SDA-6** would reduce impacts to the NCA values by limiting road construction to only those areas within the existing utility corridor; however, vegetation removal and surface disturbance would still occur within the corridor. Agency buffers and TransWest's commitment to avoidance of special status habitat would reduce impacts to desert tortoise and other special status species located within the corridor. Application of **SDA-2** (full road

reclamation) would reduce operation impacts. Adherence to agency stipulations and development of a desert tortoise mitigation plan would reduce impacts to desert tortoise within the corridor during construction.

Within the Caliente FO, approximately 10 miles of the 250-foot-wide transmission line ROW would cross the 36,800-acre Mormon Mesa-Ely ACEC. The ACEC is managed for the protection of critical desert tortoise habitat as a ROW avoidance area outside of designated corridors. During construction, approximately 290 acres (0.8 percent of the ACEC) would be subject to vegetation removal and surface disturbance that could affect desert tortoise or other special status species habitat. The 250-foot-wide transmission line ROW would be largely located within an existing designated utility; however, approximately 2 acres would be located within designated ROW exclusion areas. Additionally, of the approximately 10,720 acres of the 2-mile transmission line corridor that would be located within the ACEC (29 percent of the ACEC), 6,534 acres would be in ROW exclusion areas. Development of a transmission line or associated roads would not be in conformance with area management. The Ely RMP contains numerous BMPs to reduce impacts to desert tortoise including a development mitigation plan that includes surveys and monitoring, employee education, and other measures to reduce impacts to desert tortoise. Application of **SDA-3** would limit the impacts to ACEC values from road construction and human activity to only those areas within the existing utility corridor. **SDA-2** (full road reclamation) would further reduce risk; however, initial vegetation removal and surface disturbance would still occur within the corridor. Adherence to agency stipulations and development of a desert tortoise mitigation plan would reduce impacts to desert tortoise within the corridor during construction.

Within the Las Vegas FO, approximately 8 miles of the 250-foot-wide transmission line ROW would cross the 151,360-acre Mormon Mesa ACEC. The ACEC is managed as a ROW avoidance area outside of designated corridors to protect critical desert tortoise habitat. Reclamation of temporary roads is required, and ROW corridors are limited to 3,000 feet. During construction, approximately 234 acres (0.2 percent of the ACEC) would be subject to vegetation removal and surface disturbance that could affect desert tortoise habitat. The 250-foot-wide transmission line ROW would be located entirely within an existing designated utility corridor; therefore, it would be in conformance with area management. Agency BMPs and TransWest's commitment to avoidance of special status habitat would reduce impacts to desert tortoise within this corridor areas. Approximately 6,550 acres of the of the 2-mile transmission line corridor would be located within the ACEC (4 percent of the ACEC). Of this total acreage, approximately 4,555 acres would be located within ROW avoidance areas. Application of **SDA-3** would limit the impacts to ACEC values from road construction and human activity by restricting activities to only those areas within the existing utility corridor.

Under Alternative III-A, the 250-foot-wide transmission line ROW would cross a segment of the Muddy River eligible for WSR "recreational" designation on the basis of its outstanding remarkable wildlife, cultural, and fish features. Approximately 213 acres of the 2-mile transmission line corridor would be within the 11-mile eligible river segment.

Under BLM Wild and Scenic Rivers Policy and Program Direction for Identification, Evaluation, and Management (BLM Manual 8351), new transmission lines, natural gas lines, water lines, etc., are discouraged unless specifically authorized by other plans, orders, or laws. Where no reasonable alternate location exists, additional or new facilities should be restricted to existing ROWs. Alternative III-A is not within a designated utility corridor and there are other alternatives that could be selected that would cross the river segment within designated utility corridors. Per BLM WSR guidance, where new ROWs are unavoidable, locations and construction techniques shall be selected to minimize adverse effects on recreational river area related values and fully evaluated during the site selection process.

Under Alternative III-A, the river crossing location would not be within a designated utility corridor; however, development of a transmission line crossing would be consistent with the criteria for a "recreational" designation (substantial evidence of human activity, readily accessible by road, etc.). Impacts to the outstanding remarkable features of the river segment would be reduced by design features and agency BMPs, including riparian habitat and sensitive species habitat buffers, and BMPs to reduce potential for

erosion and sedimentation that could affect fish habitat. Potential impacts to cultural resources from surface disturbance would be mitigated through the compliance with the Project PA.

The following mitigation is suggested to ensure compatibility with the BLM WSR Policy:

SDA-7: *ROW, road, or ground electrode placement within river segments that are eligible for inclusion in the NWSRS shall be micro-sited in coordination with BLM to minimize surface disturbance or visual disturbance from towers, roads, or other facilities to the outstandingly remarkable features that led to segment eligibility.*

Application of this mitigation would allow the BLM to protect the "recreational" classification of this river segment until a suitability analysis has been completed.

USFS IRAs and URUD Areas

Alternative III-A would cross approximately 2 miles of a designated IRA and approximately 4 miles of a URUD area within the Dixie National Forest; the 2-mile transmission line corridor would encompass portions of four additional IRA/URUD areas.

Approximately 2 miles of the 250-foot-wide transmission line ROW would cross the 17,663-acre Atchinson IRA; 4 miles would cross the 24,306-acre Atchison URUD area. The Atchinson IRA and Atchinson URUD area comprise most of the same acreage, but there is approximately 6,600 acres of URUD area that are outside of the IRA. The Atchinson IRA/URUD area was rated by the USFS as having a low natural integrity, medium undeveloped character, medium opportunities for solitude, low opportunities for primitive recreation, and medium manageability (USFS 2009b).

Alternative III-A would parallel one or more existing transmission lines but would be largely outside of the WWEC-designated utility corridor within the IRA/URUD area. Disturbances would be located on the western edges of the IRA/URUD area (see **Figure 3.15-16**), keeping over 99.9 percent of the IRA and URUD area unfragmented and well over the requisite 5,000 acres with minimal effect to manageability.

Use of a full 250-foot-wide transmission line ROW would result in up to 124 acres of vegetation removal within the Atchinson URUD area, 45 of which would be in the Atchinson IRA. Roadless construction methods (as identified in the PDTR, see **Appendix D**) would be utilized within IRAs to ensure compliance with the Roadless Rule. These include use of helicopters for tower placement, use of existing roads, and overland travel. Application of the roadless construction techniques within IRAs would reduce the ROW within the Atchinson IRA to about 23 acres and would eliminate the surface disturbance associated with new roads within the IRA.

During construction, there would be surface disturbance within the Atchinson IRA associated with overland travel as well as the vegetation removal and surface disturbance from the transmission line placement itself (up to 23 acres). TransWest would span sensitive resources (such as threatened and endangered species habitat, cultural resources, wetlands, etc.; see **Appendix C** for a full list of design features) and use selective vegetation removal whenever possible to reduce resource impacts. Helicopter construction would require the use of 7-acre helicopter fly yards located every 5 miles along the area where helicopter construction is planned; however, it is anticipated that these would be located outside of the IRA. Application of design features in **Appendix C**, specifically the development of vegetation and noxious weed management plans to address plant removal, selective clearing, and reclamation consistent with agency permitting stipulations for soils, water, vegetation and wildlife, also would reduce impacts to habitat and wildlife throughout the area. Reclamation areas would be monitored for 3 to 5 years in accordance with USFS requirements (see **Appendix D**). As a result, the limited amount of construction ground disturbance within the IRA would not impact the diversity of plants and animals within the IRA.

There are no impaired streams within the IRA/URUD areas. TransWest would use design features and BMPs to reduce sedimentation to protect water resources within the IRA/URUD, and there would be no impact to the groundwater resources used by resident of Pine Valley and Central.

About half of the 250-foot-wide ROW acreage within the Atchinson IRA would be in areas designated as roaded natural; the other half would be in areas designated as semi-primitive motorized and non-motorized ROS. The sights and sounds of construction would not be consistent with semi-primitive motorized and non-motorized ROS designations; however, impacts to opportunities for primitive recreation in these areas would be temporary and would not affect the majority of the IRA (see Section 3.13, Recreation, for more information about acreages by ROS).

During operations, TransWest would use aircraft or non-motorized methods for maintenance and would work with the USFS to identify appropriate vegetation management techniques and to prevent unauthorized travel along the ROW by off-road vehicles. Standard vegetation management techniques would result in a 250-foot-wide corridor of low-growth plant communities ranging from 2 to 6 feet in height. Depending on the location and habitat type, this type of vegetation management could result in long term loss of wildlife habitat. Impacts from operation would be reduced through application of **SDA-5** (Class 2 or Class 3 vegetation maintenance options). Application of this mitigation would minimize disturbance to wildlife habitat. Level 2 vegetation management would reduce the area with 6-foot vegetation height restrictions to 90 feet wide and allow vegetation at the outside edges of the ROW to reach a maximum height of 35 feet. Level 3 vegetation management would allow increased vegetation heights anywhere within the ROW as along as vegetation does not encroach on the required minimum clearances (about 29 feet).

The existing landscape character of the IRA would be modified by the presence of the transmission line within the IRA; however, the route would parallel one or more existing transmission lines and would be located in areas where existing man-made features have already affected wilderness character. Visual impacts and proposed mitigation are discussed in greater detail in Section 3.12, Visual Resources. There are no known cultural resource sites within the Atchinson IRA/URUD area and no other special features or values characterizing wilderness potential present within the IRA. Impacts to any cultural resource sites would be mitigated per the PA (see Section 3.11, Cultural Resources and Native American Concerns).

Overall, the impacts associated with construction, operation, and maintenance would result in a permanent loss of acres where the Project would cross the Atchinson IRA, would diminish the natural appearance and undeveloped character of the outermost portion of Atchinson IRA, and could decrease any opportunities for solitude and primitive recreation in or near those areas, if any exist. However, the wilderness characteristics of the area have already been affected by existing man-made features present in the area, and changes in the wilderness qualities would not be large enough to preclude management of the areas as an IRA and/or wilderness.

Outside of the Atchinson IRA, the 250-foot-wide transmission line ROW would encompass approximately 80 additional acres of the Atchinson URUD area. In addition, the 2-mile transmission line corridor in which access roads or other construction support areas also could be located would encompass 4,217 acres within the Atchinson URUD area (3,229 acres within the Atchinson IRA), as well as portions of the Bull Valley, Moody Wash, Mogotsu, and Cove Mountain IRA/URUD areas (see **Tables 3.15-14** and **3.15-15**). While access road construction within IRAs would not be in conformance with area management (see roadless construction techniques described above), there is no specific management restriction precluding road development in URUD areas outside of IRAs, provided the Standard and Guideline for general forest management are met. Therefore, any construction within the approximately 1,000 acres that would be located within the 2-mile transmission line corridor and within the Atchinson URUD area but outside of the Atchinson IRA, and the 800 acres that would be within the Bull Valley, Moody Wash, Mogotsu and Cove Mountain URUD areas but not within their respective IRAs (see **Table 3.15-14** and **Table 3.15-15**) would not be required to adhere to roadless construction techniques. As a result, these areas could be subject to access road and support facility development that would result in additional surface disturbance and/or vegetation removal, with concomitant impacts to wildlife habitat, opportunities for solitude and primitive

recreation, and wilderness character. Application of **SDA-1** (avoidance of new road construction in SDAs) and **SDA-6** (application of roadless construction techniques within URUD areas) would eliminate all portions of the 2-mile transmission line corridor within URUD areas from use for access roads or staging areas. This would eliminate most potential impacts to wilderness qualities except for the visual impacts described above and would allow the Dixie National Forest to continue to consider these areas for IRA and/or wilderness designation when they complete their LRMP revision.

Other Federally Managed SDAs and National Trails

Within Utah, Alternative III-A would cross 3 segments of the Old Spanish NHT within the N. Cedar City AU; two additional trail segment crossings would be located on NFS land within the Dixie National Forest. These portions of the Old Spanish NHT were not included in the 2012 NHT Inventory and there are no NHT Condition Class ratings for these segments or information as to which segments within N. Cedar City AU or the Dixie National Forest contribute to the trail's NHT status.

Within the N. Cedar City AU, the proposed trail crossing would be located near an existing transmission line. There are no associated historic sites, recreation areas, or interpretive features located near trail segments in this area.

Within the Dixie National Forest, the proposed trail crossing would be located near Spring Creek and within a WWEC-designated corridor and would parallel an existing transmission line. There is one associated historic site located near affected trail segments in this area, the Mountain Meadows NHL and Site. This site would be located 0.1 mile from the transmission line.

Within Nevada, Alternative III-A would cross one segment of the Old Spanish NHT located on BLM land east of I-15, near Logandale (within the Mormon Mesa AU). This segment is rated as NHT-I and contributes to the trail's NHT status. There are no associated historic sites, recreation areas, or interpretive features located near trail segments in this area; however, the trail is located near the Meadow Valley Wash and Muddy River, two waterbodies of importance to travelers. The crossing would be in compliance with the Las Vegas RMP as the crossing would be located within a WWEC-designated utility corridor. Towers would be placed to avoid surface disturbance near the actual trail.

Alternative III-A also would be visible from the Old Spanish NHT for approximately 23 miles of trail segments. **Table 3.15-17** summarizes key features of trail segments that would be in the Alternative III-A viewshed.

Table 3.15-17 Alternative III-A Visibility Impacts by Old Spanish NHT Analysis Unit

AU (Location)	Segment Rating	Number of Segments	Contributing to NHT Status	Miles of Trail within Viewshed[1]	Total Mileage within AU	Percentage of AU within Viewshed
Mormon Mesa (Las Vegas FO; (12 miles total)	Highest rating within AU (NHT-I; exceptional)	2	1 contributing, one unevaluated	8	8	100
	Remaining mileage (evident)	3	1 contributing, 2 unevaluated	1	4	25
California Crossing (Las Vegas FO; 3 miles total)	Highest rating within AU (NHT-II; exceptional)	1	unevaluated	1	1	100
	Remaining mileage (high potential)	0	NA	0	2	0
Dixie National Forest		N/A	Unknown	13	N/A	N/A

[1] Visibility of Alternative III-A from the historic trail is based on the 5-mile viewshed.

Trace ratings are not available for the 13 miles of trail that would be visible on NFS lands, and it is not known which segments within the viewshed contribute to the trail's NHT status. There is one associated historic site located near affected trail segments in this area, the Mountain Meadows NHL and Site. This site would be located 0.1 mile from the transmission line. Proposed visual mitigation (see Section 3.12, Visual Resources) would reduce visual contrasts to a level consistent with LRMP objectives for this area.

Of the 10 miles located on BLM lands, approximately 8 miles of trail segments are categorized as NHT-I (location verified, evident, and unaltered); approximately 1.9 miles of trail segments are categorized as NHT-II (location verified and evident with minor alteration); and, approximately 0.1 mile is categorized as NHT-IV (location verified and permanently altered).

Within the Mormon Mesa AU, selection of Alternative III-A would result in visual impacts to about 9 miles (75 percent) of the 12 miles of inventoried trail within the AU. This includes 8 miles of trail rated as NHT-I/Exceptional (100 percent of the highest rated mileage within the AU). The remaining mileage comprises trail segments that are considered to be "Evident." Affected mileage constitutes 25 percent of "Evident" segments within the AU. Two of the five trail segments within the viewshed contribute to the trail's NHT status. The presence of the transmission line would affect the historic setting of the trail (currently characterized as retained) and could affect opportunities for the public to access and enjoy the trail. Integrity of historic setting is retained throughout this AU, and scenic quality over most of the AU is average (Class B, with an SQRU score of 15 except for the easternmost area along the Virgin River, which has high scenic quality (Class A, with a SQRU score of 21), resulting in an overall rating of SI (AECOM 2012). The portions of the trail segments that are within Class A rated areas would not be within the viewshed of the transmission line. Selection of Alternative III-A would result in a 4 point reduction in the SQRU score for this area, reducing the score to 11 (Class C) for trail segments within the transmission line viewshed. Overall rating of these segments would be correspondingly reduced to SII. The I-15 rest stop would be within immediate foreground (0.0 to 0.5-mile) visibility of the transmission line. The rest does not currently offer interpretive materials related to the Old Spanish NHT.

Within the California Crossing AU, selection of Alternative III-A would result in visual impacts to about one mile (33 percent) of the 3 miles of inventoried trail within the AU. This mileage is rated as NHT-I/Exceptional and constitutes 100 percent of the highest rated mileage within the AU. No another trail segments would be affected. The contributing status of this trail segment has not been evaluated. The presence of the transmission line would affect the historic setting of the trail (currently characterized as retained), but scenic quality is already within the lowest class (C, with a SQRU score of 8.5). There are no associated historic sites, interpretive sites, or recreation areas located near these segments, and this AU is not likely to be used as an interpretation site for the public as trail locations or traces are not readily visible.

Once the final route is selected, an intensive Class III inventory and in-depth visual analysis would be conducted to determine the impact to contributing Old Spanish NHT segments crossed by the route or from which the route would be visible. If a contributing segment would be adversely affected, the effects would be minimized or mitigated onsite or offsite as stipulated in the Cultural Resources PA developed for the Project, and through implementation of design features and BMPs in concert with the Trail Study Agency and the Wyoming BLM National Trails Management Program Lead. Mitigation identified in Section 3.12, Visual Resources, includes measures to reduce visual impacts through use of BLM environmental colors and location of structures, roads, and other project elements as far back from road, trail, and river crossings as possible, and where feasible, employ terrain and vegetation to screen views from crossings

Alternative III-B (Agency Preferred)

Under Alternative III-B, the 250-foot-wide transmission line ROW would cross the Mormon Mesa-Ely (Caliente FO) and Mormon Mesa (Las Vegas FO) ACECs, Muddy River WSR, and the Meadow Valley Wash WSR. Portions of the 2-mile transmission line corridor also would cross the Beaver Dam Slope ACEC (in the Caliente FO) and the Clover Mountains Wilderness.

BLM SDAs and National Landscape Conservation System Lands

Alternative III-B would cross both the Caliente FO Mormon Mesa-Ely and Las Vegas FO Mormon Mesa ACECs. Impacts would be the same as described under Alternative III-A except that 9 miles (265 acres) of the 250-foot-wide transmission line ROW would cross the Caliente FO ACEC and 15 miles (441 acres) would cross the Las Vegas FO ACEC. Portions of the 2-mile transmission line corridor in which roads and construction support areas would be located also would fall within these two ACECS. Impacts would be similar to those described under Alternative III-A for the Caliente FO ACEC but with 105 acres less impacted. Within the Las Vegas FO ACEC, approximately 12,580 acres (8 percent) of the 2-mile transmission line corridor would fall within the ACEC, 6,663 acres of which would be located within ROW avoidance areas.

Under Alternative III-B, the 250-foot-wide transmission line ROW would cross a segment of the Muddy River eligible for inclusion as a WSR under a “recreational” designation. Impacts would be similar as under Alternative III-A, except that only 81 acres of the 2-mile transmission line corridor would be within the 11-mile eligible river segment, and the 250-foot-wide transmission line ROW would be within a designated utility corridor. The placement of Alternative III-B is consistent with BLM Manual 8351, which states that when no reasonable alternate location exists, additional or new facilities should be restricted to existing ROWs. Impacts would be minimized by application of **SDA-7**, which would require micro-siting of facilities to minimize surface disturbance or visual disturbance to the segment’s outstandingly remarkable features.

The 250-foot-wide transmission line ROW also would cross a segment of the Meadow Valley Wash. This riparian system is eligible for inclusion as a WSR under a “scenic” designation. Approximately 19 acres of the 250-foot-wide transmission line ROW and 374 acres of the 2-mile transmission line corridor would be within the 11-mile eligible segment. The crossing would not be within a designated utility corridor. Development of a transmission line would not be consistent with the criteria for a “scenic” designation (largely primitive and undeveloped, no substantial evidence of human activity, etc.). There are other alternatives that could be selected that do not cross segments eligible for inclusion into the NWSRS; however, this alternative was selected as the agency preferred alternative (i.e., the route that best addressed multiple resource concerns). Impacts to the outstanding remarkable features (wildlife, cultural and fish) of the eligible wash segment would be reduced by design features and agency BMPs, including riparian habitat and sensitive species habitat buffers and BMPs to reduce potential for erosion and sedimentation that could affect fish habitat. Potential impacts to cultural resources from surface disturbance would be mitigated through the compliance with the Project PA. Application of **SDA-1** and **SDA-2** would reduce or limit roads development within the eligible segment whenever possible, or require reclamation where avoidance is not practicable; however, the visual impacts from operation of the line would not be mitigated. Application of **SDA-7** would require micro-siting of facilities to further minimize surface disturbance or visual disturbance to the segment’s outstandingly remarkable features.

Approximately 545 acres of the 2-mile transmission line corridor in which roads and construction support areas would be within the Clover Mountains Wilderness Area. This would comprise 0.6 percent of the SDA. The Caliente FO has identified all designated wilderness as ROW exclusion areas. Development of roads or use of motorized vehicles within this portion of the 2-mile transmission line corridor would not be compatible with area management. TransWest’s commitment to comply with agency stipulations (TWE-1) and/or implementation of **SDA-1** would eliminate potential impacts within the wilderness area from road construction; however, the wilderness quality in the areas closest to the 250-foot-wide transmission line ROW could be temporarily reduced by noise and activity during construction.

Approximately 306 acres of the 2-mile transmission line corridor would be located within the 36,800-acre Beaver Dam Slope ACEC in the Caliente FO. This area of the ACEC is designated for protection of desert tortoise. Application of **SDA-3** would limit the impacts to ACEC values from road construction and human activity by restricting activities to only those areas within the existing utility corridor.

USFS IRAs and Unroaded/Undeveloped Areas

Alternative III-B would not cross any designated IRAs or URUD areas.

Other Federally Managed SDAs and National Trails

Alternative III-B would not cross not the Old Spanish NHT but would be visible for approximately 6 miles of inventoried trail. Of those 6 miles, approximately 5 miles of trail segments are categorized as NHT-I (location verified, evident, and unaltered); approximately 1 mile of trail segments are categorized as NHT-II (location verified and evident with minor alteration); and, approximately 0.1 mile is categorized as NHT-IV (location verified and permanently altered). Visibility of the alternative from the historic trail and road is based on the 5-mile (either side of the 250-foot transmission line ROW) viewshed or indirect APE. These segments would be located within the Mormon Mesa and California Crossing AUs.

Table 3.15-18 summarizes key features of trail segments that would be in the Alternative III-B viewshed.

Table 3.15-18 Alternative III-B Visibility Impacts by Old Spanish NHT Analysis Unit

AU	Segment Rating	Number of Segments	Contributing to NHT Status	Miles of Trail within Viewshed[1]	Total Mileage within AU	Percentage of AU within Viewshed
Mormon Mesa (Las Vegas FO; (12 miles total)	Highest rating within AU (NHT-I; exceptional)	2	1 contributing, one unevaluated	5	8	63
	Remaining mileage	3	1 contributing	0.2	4	5
California Crossing (Las Vegas FO; 3 miles total)	Highest rating within AU (NHT-II; exceptional)	1	Unevaluated	1	1	100
	Remaining mileage	0	NA	0	2	0

[1] Visibility of Alternative III-B from the historic trail is based on the 5-mile viewshed.

Impacts would be similar to those described under Alternative III-A, but would affect fewer mileage of inventoried trail segments for the Mormon Mesa AU (41 percent of the total inventoried mileage of Old Spanish NHT within the AU and 63 percent of the highest rated segments).

Once the final route is selected, an intensive Class III inventory and in-depth visual analysis would be conducted to determine the impact to contributing Old Spanish Trail segments crossed by the route or from which the route would be visible. If a contributing segment would be adversely affected, the effects would be minimized or mitigated onsite or offsite as stipulated in the Cultural Resources Programmatic Agreement developed for the Project, and through implementation of design features and BMPs in concert with the Trail Study Agency and the Wyoming BLM National Trails Management Program Lead. Mitigation identified in Section 3. 12, Visual Resources includes measures to reduce visual impacts through use of BLM environmental colors and location of structures, roads, and other project elements as far back from road, trail, and river crossings as possible, and where feasible, employ terrain and vegetation to screen views from crossings.

Alternative III-C

The Alternative III-C 250-foot-wide transmission line ROW would cross the Desert NWR, the Delamar Mountains Wilderness, the Kane Springs ACEC, and the Coyote Springs ACEC. Portions of the 2-mile transmission line corridor also would cross the Arrow Canyon Wilderness, Pahranagat NSR, and portions of five USFWS proposed wilderness areas.

BLM SDAs and National Landscape Conservation System Lands

Within the Caliente FO, approximately 10 miles of the 250-foot-wide transmission line ROW would cross the 57,190-acre Kane Springs ACEC. To protect desert tortoise, the ACEC is managed as a ROW exclusion area outside the existing corridor. Approximately 9 miles of the 250-foot-wide transmission line ROW would

fall outside the designated corridor. During construction, approximately 296 acres (0.5 percent of the ACEC) would be subject to vegetation removal and surface disturbance that could affect desert tortoise. Additionally, of the approximately 6,340 acres of the 2-mile transmission line corridor located within the ACEC (28 percent of the ACEC), 5,298 acres would be in ROW exclusion areas. Development of a transmission line or associated roads would not be in conformance with area management. The Ely RMP contains numerous BMPs to reduce impacts to desert tortoise including a development mitigation plan that includes surveys and monitoring, employee education, and other measures to reduce impacts to desert tortoise. Application of **SDA-3** would limit the impacts to ACEC values by restricting road construction and human activity to only those areas within the existing utility corridor. **SDA-2** (full road reclamation) would further reduce risk; however, initial vegetation removal and surface disturbance would still occur within the corridor. Adherence to agency stipulations and development of a desert tortoise mitigation plan would reduce impacts to desert tortoise within the corridor during construction.

Within the Las Vegas FO, approximately 19 miles of the 250-foot-wide transmission line ROW would cross the 75,500-acre Coyote Springs Valley ACEC. To protect desert tortoise, the ACEC is managed as a ROW avoidance area outside the existing corridor. Approximately 1 mile of the 250-foot-wide transmission line ROW would fall outside the designated corridor. During construction, approximately 563 acres (0.01 percent of the ACEC) would be subject to vegetation removal and surface disturbance that could affect desert tortoise. Agency BMPs and TransWest's commitment for avoidance of special status habitat would reduce impacts to desert tortoise within this corridor area. Approximately 24,327 acres of the 2-mile transmission line corridor would be located within the ACEC (32 percent of the ACEC); of this total acreage, approximately 10,566 acres are located within ROW avoidance areas. Application of **SDA-3** would limit the impacts to desert tortoise from road construction and human activity by restricting activity to only those areas within the existing utility corridor.

Approximately 2,697 acres of the 2-mile transmission line corridor would fall within the Delamar Mountain Wilderness; an additional 346 acres would fall within the Arrow Canyon Wilderness. The Ely FO has identified all designated wilderness as ROW exclusion areas.

USFS IRAs and URUD Areas

Alternative III-C would not cross any designated IRAs or URUD areas.

Other Federally Management SDAs and National Trails

Approximately 1 mile of the 250-foot-wide transmission line ROW would cross the 1.5 million-acre Desert NWR. The refuge was established for the protection, enhancement, and maintenance of desert bighorn sheep. As part of the Lincoln County Conservation, Recreation, and Development Act of 2004 (PL 108–424), administrative jurisdiction over approximately 8,382 acres of land along the eastern boundary of Desert NWR and west of U.S. Highway 93 was transferred from the USFWS to the BLM for use as a utility corridor. The majority of the 250-foot-wide transmission line ROW would fall within this corridor. During construction, approximately 25 acres of the Refuge would be subject to vegetation removal and surface disturbance that could affect bighorn sheep. Adherence to design features, agency BMPs, and wildlife mitigation identified in Section 3.7 would reduce impacts to wildlife species within this NWR. Approximately 16,524 acres of the NWR would fall within the area of the 2-mile transmission line corridor in which roads and construction support areas could be built. This would comprise about 1.1 percent of the NWR. Development of roads is not prohibited within the NWR outside of the proposed wilderness areas, but would result in surface disturbance, noise, and activity that would impact NWR values. TransWest's commitment to comply with agency stipulations (TWE-1) and/or implementation of **SDA-1** would eliminate potential impacts to wildlife within the refuge from road construction.

Approximately 170 acres of the Pahranagat NWR would be within the 2-mile transmission line corridor. The refuge provides habitat for migratory birds, especially waterfowl. Development of roads is not prohibited within the NWR. Adherence to design features and agency BMPs to protect desert tortoise and cultural resources as well as measures to reduce fugitive dust and other impacts that occur from road construction

would reduce impacts to wildlife resources within the refuge. Wildlife mitigation identified in Section 3.7, Wildlife, and Section 3.8, Special Status Wildlife Species, also would reduce impacts to shorebirds and other migratory bird species.

The 2-mile transmission line corridor would also contain 18,823 acres of area proposed by the USFWS for wilderness designation. Development of roads or use of motorized vehicles within this portion of the 2-mile transmission line corridor would not be compatible with area management. TransWest's commitment to comply with agency stipulations (TWE-1) and/or implementation of SDA-1 would eliminate potential impacts within the wilderness area from road construction; however, the wilderness quality in the areas closest to the 250-foot-wide transmission line ROW could be temporarily reduced during construction from noise and activity.

Alternative Variations in Region III

The land ownership crossed by the alternatives in Region III and other key impact parameters are summarized in **Table 3.15-19**.

Alternative Connector in Region III

The Moapa Alternative Connector and the Avon Alternative Connector would not cross any SDAs in Region III. The Moapa Alternative Connector would be visible from the Old Spanish Trail for approximately 1 mile. The 1-mile segment is categorized as NHT II (location verified and evident with minor alteration).

Table 3.15-19 Impact Parameters of Alternative Variations and Comparative Portions of Alternatives in Region III

Ox Valley East Alternative Variation	Comparable (Portions of Alt III-A)	Ox Valley West Alternative Variation	Comparable (Portions of Alt III-A)	Pinto Alternative Variation	Comparable (Portions of Alt III-A)
SDAs Crossed by 250-foot-wide transmission line ROW					
IRAs: 1 mile (34 acres) in Gum Hill IRA; <0.5 mile (7 acres) in Mogotsu IRA URUD areas: 9 miles (269 acres) in Moody Wash/Mogotsu URUD area. Old Spanish NHT: 1 trail crossing, 6 miles of trail within viewshed, Mountain Meadows NHL and Site located 3 miles from the transmission line	IRAs: 2 mile (45 acres) within Atchinson IRA URUD areas: 4 mile (124 acres) within Atchinson URUD area. Old Spanish NHT: 2 trail crossings, 13 miles of trail within viewshed, Mountain Meadows NHL and Site located 0.1 mile from the transmission line	IRAs: No reference line crossings, less than 0.5 acre in Gum Hill IRA URUD areas: 9 miles (275 acres) in Moody Wash/Mogotsu URUD area. Old Spanish NHT: 1 trail crossing, 6 miles of trail within viewshed, Mountain Meadows NHL and Site located 3 miles from the transmission line	IRAs: 2 miles (45 acres) in Atchinson IRA URUD areas: 4 mile (124 acres) within Atchinson URUD area. Old Spanish NHT: 2 trail crossings, 13 miles of trail within viewshed, Mountain Meadows NHL and Site located 0.1 mile from the transmission line	IRAs: No reference line crossings, less than 0.5 acre in Atchinson IRA. URUD areas: 1 mile (41 acres) in Cove Mountain, 6 miles (176 acres) in Atchinson, 2 miles (57 acres) in Kane Mountain and 4 miles (122 acres) in Pine Valley Mountain URUD areas. Old Spanish NHT: 0 trail crossing, 3 miles of trail within viewshed, Mountain Meadows NHL and Site located 5 miles from the transmission line	IRAs: 2 miles (45 acres) in Atchinson IRA. URUD areas: 4 mile (124 acres) within Atchinson URUD area. Old Spanish NHT: 2 trail crossings, 13 miles of trail within viewshed, Mountain Meadows NHL and Site located 0.1 mile from the transmission line
SDAs Crossed by 2-mile Transmission Line Corridor					
IRAs: 9,829 acres within Gum Hill, Mogotsu, and Moody Wash IRAs. URUD areas: 11,298 acres in Moody Wash/Mogotsu URUD area.	IRAs: 9,122 acres within Atchinson, Cove Mountain, and Mogotsu IRAs. URUD areas: 10,416 acres in Moody Wash/ Mogotsu, Cove Mountain, and Atchinson URUD areas	IRAs: 6,928 acres within Gum Hill, Mogotsu, and Moody Wash IRAs. URUD areas: 9,964 acres in Moody Wash/Mogotsu URUD area.	IRAs: 9,122 acres within Atchinson, Cove Mountain, and Mogotsu IRAs. URUD areas: 10,416 acres in Moody Wash/ Mogotsu, Cove Mountain, and Atchinson URUD areas.	IRAs: 7,276 acres in Atchinson, Cove Mountain, Kane Mountain, and Pine Mountain IRAs. URUD areas: 16,422 acres in Atchinson, Cove Mountain, Kane Mountain, and Pine Mountain URUD areas.	IRAs: 11,613 acres within Atchinson, Cove Mountain, and Mogotsu IRAs. URUD areas: 12,847 acres in Moody Wash/ Mogotsu, Cove Mountain, and Atchinson URUD areas.

Alternative Ground Electrode Systems in Region III

A ground electrode system of approximately 600 acres in size would be necessary in Region III within 50 to 100 miles of the southern terminal, as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the Project proponent. The ground electrode system alternative locations that would be in Region III are depicted in Chapter 2.0 on **Figure 2-23**. The conceptual sites would not include any SDAs; however the Meadow Valley ground electrode system siting area (Alternative III-C) would include 406 acres within a portion of the Meadow Valley Wash riparian system eligible for inclusion as a WSR under a "scenic" designation. Development of a ground electrode site within this area would not be consistent with the criteria for a "scenic" designation (largely primitive and undeveloped, no substantial evidence of human activity, etc.). Impacts to the outstanding remarkable features (wildlife, cultural, and fish) of the eligible wash segment would be reduced by design features and agency BMPs, including riparian habitat and sensitive species habitat buffers, and BMPs to reduce potential for erosion and sedimentation that could affect fish habitat. Potential impacts to cultural resources from surface disturbance would be mitigated through the compliance with the Project PA. Application of **SDA-1** and **SDA-2** would reduce or limit roads development within the eligible segment whenever possible, or require reclamation where avoidance is not practicable; however, the visual impacts from operation of the line would not be mitigated. Application of **SDA-7** would require micro-siting of facilities to further minimize surface disturbance or visual disturbance to the segment's outstandingly remarkable features. The Meadow Valley ground electrode system siting area would also include less than 0.5 acres within the Mormon Mesa ACEC. The ACEC is managed as a ROW avoidance area outside of designated corridors to protect critical desert tortoise habitat.

Application of **SDA-4** (ground electrode systems shall be sited outside of any designated SDAs located within the ground electrode siting areas), **SDA-1** (avoidance of new road construction in SDAs), and **SDA-3** (avoidance of SDAs within ground electrode siting areas in final placement of ground electrode site) would eliminate construction of any access roads within this area.

Additionally, under Alternatives III-A and III-B, the Mormon Mesa-Carp Elgin Rd ground electrode system siting area would encompass portions of the Old Spanish Trail and the associated access road and transmission line would parallel five Old Spanish NHT segments for approximately 4 miles. Application of **SDA-4** would eliminate direct impacts to the trail from the ground electrode system but would not reduce impacts from the access road and transmission line. The majority of the mileage is rated as NHT-I, and two of the five segments contribute to the trail's NHT status. Impacts would be similar to those described under Alternative III-A; however, the presence of a ground electrode system would not be expected to reduce the current Class B scenic quality rating or the current SI overall rating for portions of the AU within the viewshed.

Region III Conclusion

All alternatives within Region II would result in impacts to SDAs designated by the BLM for the protection of desert tortoise. Of the three alternatives, Alternative III-A would result in the most mileage within in these SDAs (approximately 30 miles; 900 acres of 250-foot-wide ROW within 1 NCA and 3 ACECs in Nevada and Utah). Alternative III-B would have the least impacts to these resources (approximately 24 miles and 700 acres of 250-foot-wide ROW within 2 ACECS in Nevada). Alternative III-C would impact these resources equally (40 miles and 940 acres of 250-foot-wide transmission line ROW).

Alternative III-B would have the most impacts to WSRs, as it would have two crossings to segments eligible for inclusion as WSRs. Alternative III-C would not cross any WSR-eligible segments.

Of the three alternatives, only Alternative III-A would impact USFS IRAs and URUD areas. Roadless construction techniques would be used in IRAs to reduce surface disturbance within IRAs, but there would still be impacts from the transmission line itself within one IRA.

Alternatives III-A and III-B would not affect any other federally managed SDAs. Alternative III-C would impact two USFWS Wildlife Refuges and five proposed wilderness areas; however, TWE design features and mitigation measures would eliminate many of the impacts to these areas.

Alternative III-A would have the greatest impact on NHTs as it would cross three segments of the Old Spanish NHT and would affect the viewshed of approximately 10 miles of the Old Spanish NHT. Alternative III-C would not affect NHTs. Alternative III-B would not cross any NHTs, but would affect the viewshed of 6 miles of the Old Spanish NHT.

3.15.4.6 Region IV

Table 3.15-16 provides a list of the SDAs that would be located within the Project corridors in Region IV. These areas also are depicted in **Figures 3.15-4**, **3.15-8**, and **3.15-12**. The list of areas identifies SDAs within the 250-foot-wide transmission line ROW as well as those outside of the ROW but within the 2-mile transmission line corridor.

Table 3.15-20 Region IV: SDAs within 250-foot-wide Transmission Line ROW and 2-Mile Transmission Line Corridor

Special Designations Area	Alternative IV-A 250-foot ROW miles/acres 2-mile corridor acres	Alternative IV-B 250-foot ROW miles/acres 2-mile corridor acres	Alternative IV-C 250-foot ROW miles/acres 2-mile corridor acres
Sloan Canyon NCA (Las Vegas FO)	0/0 2,684	N/A	N/A
Black Mountain Wilderness (Las Vegas FO)	N/A	N/A	0/0 1,005
Sunrise Mountain ISA (Las Vegas FO)	1/33 1,312	0/<1 532	0/<1 532
Rainbow Gardens ACEC (Las Vegas FO)	11/326 10,563	3/86 2,590	3/86; 2,590
River Mountains ACEC (Las Vegas FO)	5/149 3,127	0/0 73	N/A

Note: In some instances, there may be “0” miles within a SDA but some acreage of 250-foot-wide ROW disclosed. This is because the reference line (which is identified through “mileage of 250-foot-wide ROW”) does not enter the SDA; however, there is some portion of the 250-foot-wide ROW (as disclosed in acreage) that is still located within the SDA.

<u>Alternative IV-A (Applicant Proposed and Agency Preferred)</u>

BLM SDAs and National Landscape Conservation System Lands

Under Alternative IV-A, the 250-foot-wide transmission line ROW would pass through one ISA and two ACECs. Approximately one mile of the 250-foot-wide transmission line ROW would fall within the 10,240-acre Sunrise Mountain ISA. During construction, up to 33 acres of the ISA would be subject to vegetation removal; surface disturbance areas would include temporary work sites and permanent tower locations. This area is 0.3 percent of the ISA. The ISA is a ROW exclusion area but contains a WWEC-designated utility corridor. The 250-foot-wide transmission line ROW would not be located within the existing designated utility corridor; therefore, it would not be compatible with SDA management. The existing ROW corridor would need to be expanded through a land use plan amendment; however, use of the future corridor would be contingent upon a Congressional action releasing the ISA from further wilderness consideration. An additional 1,312 acres of the 2-mile transmission line corridor also would fall within the ISA. Road development in these areas would not be compatible with SDA management. Within the ISA lie a major paved highway, numerous other roads, transmission lines, and communication sites. The BLM is required to manage the area for wilderness character until the area is released from further consideration by

Congress. The BLM has recommended the release of all acreage for uses other than wilderness, primarily because the area lacks wilderness character.

Approximately 11 miles of the 250-foot-wide transmission line ROW would fall within the 37,620-acre Rainbow Gardens ACEC. This ACEC was established to protect geological, scientific, scenic, cultural, and sensitive plant values and is a ROW avoidance area outside of designated corridors. Of the 11 miles, only about 2 miles would be within BLM or WWEC-designated utility corridors. As a ROW avoidance area, development of a transmission line would still be permitted under SDA management; however, land management actions for the Sunrise Mountain SRMA, which overlays the ACEC entirely, has a management goal to concentrate major transmission line ROWs within the confines of the designated utility corridor to reduce conflicts with recreation and to reduce impacts to scenic resources (BLM 1998; see Section 3.13, Recreation). During construction, up to 326 acres (0.9 percent of the ACEC) would be subject to vegetation removal or surface disturbance that could affect geological, scenic, cultural, or sensitive plant values. Access roads and construction staging areas also could be located within the 2-mile transmission line corridor located within the ACEC (10,563-acres or approximately 28 percent of the ACEC). ACEC management actions would require the reclamation of all temporary roads constructed within the ACEC. Agency-designated avoidance buffers in occupied special status species habitat (see **Appendix C**) would reduce impacts to the sensitive plant values for which the ACEC is managed. Surface disturbance could potentially impact Class III geological and paleontological resources (see Section 3.2, Geology); impacts would be mitigated through compliance with design features and agency BMPs including requiring a paleontological resources mitigation plan for areas known to contain paleontological resources or in areas of high potential for paleontological resources(see **Appendix C**). Adherence to the Project PA would mitigate impacts to cultural resources. There are already several existing transmission lines through Rainbow Gardens ACEC. In areas not within the viewshed of existing transmission structures, this alternative would not comply with BLM VRM Class III management objectives for the ACEC (see Section 3.12, Visual Resources). Application of **SDA-1** would limit surface disturbance within the ACEC to the 326 acres (0.3 percent of the ACEC) required for the transmission line itself and/or restrict new road development to only those areas within the designated corridor. If road development could not be avoided within the full 10,563 acres, application of **SDA-2** (full reclamation of roads) would reduce the long term impacts of road development to scenic values; however, there could still be impacts to geological or cultural values of the ACEC.

Approximately 5 miles of the 250-foot-wide transmission line ROW would fall within the 5,617-acre River Mountain ACEC. This ACEC was designated to protect bighorn sheep habitat and the scenic viewshed for Henderson and Boulder City and is a ROW avoidance area outside of designated corridors. The 250-foot-wide transmission line ROW would be fully within a designated utility corridor through the ACEC; therefore, it would be compatible with SDA management.

During construction, approximately 149 acres (2.7 percent of the ACEC) would be subject to vegetation removal and/or surface disturbance and temporarily removed from use by wildlife; however, because construction would be completed in segments and reclamation would begin immediately (see **Appendix C** design features), the total area that would experience human activity at any one time would likely be smaller. During peak construction, it is likely that bighorn sheep would be temporarily displaced from a larger area than the actual disturbance sites due to the avoidance response (see Section 3.7 for impacts on wildlife). Approximately 3,127 acres of the 2-mile transmission line corridor (56 percent of the ACEC) would fall within the ACEC and could be subject to some level of road and construction support area development, further expanding the area affected by surface disturbance and habitat loss, construction noise, and human activity. TransWest's commitment to implement seasonal restrictions to mitigate impacts on wildlife would assist in reducing impacts to big horn sheep; however, there would be some permanent loss of habitat and fragmentation. ACEC management actions would require the reclamation of all temporary roads. Application of **SDA-1** would limit surface disturbance within the ACEC to the 149 acres (2.7 percent of the ACEC) required for the transmission line itself; however, the visual impacts to the Henderson and Boulder City viewshed from operation of the line would not be mitigated.

Under Alternative IV-A, portions of the 2-mile transmission line corridor would be located within the Sloan Canyon NCA. The 48,800-acre Sloan Canyon NCA is managed to conserve, protect, and enhance the cultural, archaeological, natural, wilderness, scientific, geological, historical, biological, wildlife, educational, and scenic resources of this area. Approximately 2,684 acres of the 2-mile transmission line corridor would fall within the NCA and could be subject to some level of road and construction support area development. This would be approximately 6 percent of the SDA. These portions of the NCA are managed as semi-primitive, non-motorized areas and are classified as VRM II. Therefore, road construction in this area would not be compatible with SDA management. Application of **SDA-1** would eliminate surface disturbance within the ACEC; however, the quality of the uses in the area closest to the 250-foot-wide transmission line ROW would still be temporarily reduced from construction noise and activity. Impacts to Recreation within the NCA are discussed in Section 3.14.

Other Federally Managed SDAs and National Trails

Under Alternative IV-A, portions of the 2-mile transmission line corridor would be located within the Lake Mead NRA. Impacts to Lake Mead NRA are discussed In Section 3.13, Recreation Resources.

Alternative IV-B

BLM SDAs and National Landscape Conservation System Lands

Under Alternative IV-B, approximately 3 miles of the 250-foot-wide transmission line ROW would fall within the 37,620-acre Rainbow Gardens ACEC. Impacts and mitigation would be similar to Alternative IV-A except that during construction, approximately 86 acres of the ACEC (0.2 percent of the ACEC) would be subject to surface disturbance from transmission line construction and approximately 2,590 acres (6.9 percent of the ACEC) of the 2-mile transmission line corridor would fall within the ACEC and could be subject to some level of road and construction support area development.

Under Alternative IV-B, approximately 532 acres of the 2-mile transmission line corridor also would be located within the Sunrise Mountain ISA. This would be 5.2 percent of the ISA. Development of access roads or the use of motorized vehicles would not be compatible with area management. Impacts to wilderness values within Sunrise Mountain ISA would be similar to those discussed under Alternative IV-A. Implementation of **SDA-1** would eliminate potential impacts from road construction.

Approximately 73 acres of the 2-mile transmission line corridor would be located within the River Mountain ACEC. These areas would be subject to some level of road and construction support area development. Impacts from road construction to the relevant and important values of the River Mountain ACEC are discussed under Alternative IV-A. Implementation of **SDA-1** would eliminate potential impacts from the development of access roads.

Other Federally Managed SDAs and National Trails

Under Alternative IV-B, the 250-foot-wide transmission line ROW would be located within the Lake Mead NRA. The NPS has indicated that construction and operation of this alternative is incompatible with NRA management. Impacts to the NRA are discussed in more detail in Section 3.13, Recreation.

Alternative IV-C

BLM SDAs and National Landscape Conservation System Lands

Under Alternative IV-C, Impacts to the Rainbow Garden ACEC would be the same as Alternative IV-B.

Portions of the 2-mile transmission line corridor would also fall within the Sunrise Mountain ISA and Black Mountain Wilderness area. Impacts to Sunrise Mountain would be the same as under Alternative IV-B. Approximately 1,005 acres of the 2-mile transmission line corridor would fall within the 17,220-acre Black Mountain Wilderness area. This acreage would be 5.8 percent of the designated wilderness area. Development of roads or use of motorized vehicles would not be compatible with area management.

TransWest's commitment to comply with agency stipulations (TWE-1) and/or implementation of **SDA-1** would eliminate potential impacts within the wilderness area from road construction; however, the wilderness quality in the areas closest to the 250-foot-wide transmission line ROW could be temporarily reduced during construction from noise and activity.

Other Federally Managed SDAs and National Trails

Under Alternative IV-C, the 250-foot-wide ROW would be located within the Lake Mead NRA. The NPS has indicated that construction and operation of this alternative is incompatible with NRA management. Impacts to the NRA are discussed in more detail in Section 3.13, Recreation.

Alternative Variation in Region IV

The Marketplace Alternative Variation and the portion of Alternative IV-B that this variation would replace would not cross any SDAs.

Alternative Connectors in Region IV

SDAs crossed by the alternative connectors and other key impact parameters are summarized in **Table 3.15-21**.

Table 3.15-21 Impact Parameters of Alternative Connectors in Region IV

	Sunrise Mountain Alternative Connector	Lake Las Vegas Alternative Connector	Three Kids Mine Alternative Connector	River Mountain Alternative Connector	Railroad Pass Alternative Connector
SDAs Crossings	3 miles Rainbow Gardens ACEC 1 mile Sunrise Mountain ISA	1 mile River Mountain ACEC	3 miles River Mountain ACEC	3 miles River Mountain ACEC	0 miles in any SDAs

Region IV Conclusion

Alternative IV-A would have the greatest impacts to Sunrise Mountain ISA and would require Congressional action releasing the ISA from further wilderness consideration before construction could proceed. Alternatives IV-B and IV-C would largely eliminate impacts to the ISA through avoidance of road construction.

Alternative IV-A would have the great impacts to BLM SDAs, with potential impacts to two ACECs and one NCA. Alternative IV-A through the ACECs would be partially within designated corridors; therefore, it would be partially compatible with ACEC management. Impacts to the NCA and ACEC areas outside of designated corridors would be reduced through application of mitigation, including the avoidance of road construction. Alternative IV-C would have less impacts to BLM SDAs, crossing only one ACEC; however, it also would result in temporary indirect impacts (through noise and activity) to one BLM wilderness area. Alternative IV-B would have impacts to one ACEC but would not cross the NCA or have indirect impacts to the wilderness area.

3.15.4.7 Residual Effects

Residual effects to SDAs from the transmission line itself would be the same as those described under each action alternative and would consist primarily of visual impacts and loss of vegetation and wildlife habitat. There would be no residual effect to SDAs from road development if mitigation limiting access to existing roads is applied. In cases where access road development in SDAs would not be fully avoided, but rather limited to existing corridors and/or subject to closure/rehabilitation, residential impacts would include

vegetation loss and visual impacts until reclamation is successful. These impacts would be the same as described under each action alternative. Mitigation related to vegetation maintenance would reduce, but not eliminate, impacts to SDAs that result from vegetation loss during operation of the transmission line.

3.15.4.8 Impacts to Special Designations from the No Action Alternative

Under the No Action Alternative, the Proposed Project would not be developed. There would be no impacts to SDAs beyond existing conditions and trends.

3.15.4.9 Irreversible and Irretrievable Commitments of Resources

All operation impacts to the values of SDAs described above would be irretrievable until transmission line decommissioning, after which time the values of impacted SDAs would be reclaimed. It should be noted, however, that reclamation activities may have limited success in areas with poor soils, some vegetation communities would take years to re-establish, and some areas may never return to their former vegetation cover and composition. As such, these impacts may represent an irreversible commitment of vegetation resources and any SDAs managed for specific vegetation values. Section3.5, Vegetation, contains additional information regarding vegetation reclamation.

3.15.4.10 Relationship Between Local Short-term Uses and Long-term Productivity

Implementation of the Project would result in the use of some SDAs lands as ROW corridors. Long-term productivity of the SDAs would be largely unaffected except for areas where reclamation may have limited success.

3.16 Transportation and Access

This section of the EIS describes the national, state, and local transportation networks serving the analysis area and characterizes typical and representative transportation planning considerations within these networks. The primary topics addressed include roadway systems, design standards, traffic volumes, traffic congestion, safety, and maintenance. In addition, this section of the EIS addresses the presence of railroads, airports, and military airspace operating areas within the analysis area and related planning considerations. Transportation-related topics addressed in other sections include off-highway vehicle use (Section 3.13, Recreation Resources) and travel restrictions in areas of special designation (Section 3.14, Land Use).

3.16.1 Regulatory Background

A variety of federal, state, and local agencies administer and regulate roadways, railways, and airports. The American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) are responsible for interstate and U.S. highways. State DOTs are responsible for state highways and routes. County and local roads are controlled by the presiding jurisdiction (cities, counties). Other roads on federal lands are managed by the applicable federal agencies (NPS, BLM, USFS, etc.). Railroad operations are regulated by state commissions. Aviation is governed by the Federal Aviation Administration (FAA). Each of these regulatory and governing agencies and the military has their own authority, as detailed below.

3.16.1.1 Roadway Requirements

<u>Roadway Design Standards and Specifications</u>

In general, relevant AASHTO and the FHWA define design standards, specifications, and guidelines for roadways (Interstate and U.S. Highways) throughout the U.S. that would be used for design and traffic control of roadways in the Project area. Design standards include AASHTO publications: *A Policy on Geometric Design of Highways and Streets, Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400)* (AASHTO 2001), and *Roadside Design Guide* (AASHTO 2011). Relevant FHWA publications include the *Manual for Uniform Traffic Control Devices (MUTCD)* (FHWA 2009). Other appropriate design protocols would be followed as appropriate for the area containing the roadway.

Each state within the analysis area adopts their own set of design standards and specifications for federal and state highways or routes. Many of these refer to the manuals published by the federal agencies previously mentioned. The following are the major state department of transportation (DOT) design standards, specifications and guidelines that govern state-level roadways:

- Wyoming – Road Design Manual (Wyoming DOT [WDOT] 2004), Standard Plans (WDOT 2011), WDOT Basic and Operating Policy (WDOT 1998);
- Colorado – M&S Standard Plans (Colorado DOT [CDOT] 2006), State Highway Access Code (CDOT 1998);
- Utah – Utah DOT (UDOT) Standards and Specifications (UDOT 2008), Access Management Program (UDOT 2011); and
- Nevada – Road Design Guide 2010 (Nevada DOT [NDOT] 2010).

In addition to these references, state DOTs publish standard construction specifications detailing required materials and procedures. State DOTs also publish design standards for bridge projects. Most, if not all, roadway and bridge publications can be found on the respective state DOT websites. Current versions of these design manuals or new, relevant manuals are applied to future

transportation projects. Cities and counties also may have additional, specific design standards and specifications.

On public lands, BLM, USFS, other Federal, and state road requirements have been set forth. One primary standard applicable on public land is "The Gold Book – Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (BLM and Forest Service 2007).

On BLM-managed lands, new road construction and roads improved for Project use would be required to meet or exceed the minimum standards of width, alignment, grade, surface, and other requirements presented in the BLM Travel Management Program and BLM Manual Section 9113 (BLM 1985). On USFS lands, road construction and roads improved for Project use would be required to comply with the Forest Service Manual (FSM) (USFS 1999a) and Forest Service Handbook (FSH) (USFS 1999b). Some example sections relative to the Project are FSH 7709.56 – *Road Preconstruction Handbook (Forest Service 2010)*, FSH 7709.57 – *Road Construction Handbook (Forest Service 1992)*, and 7709.58 – *Transportation System Maintenance Handbook (Forest Service 2009b)*.

Corresponding BLM and USFS travel management plans have been developed and apply throughout the analysis area. The plans are designed to provide decision-makers with information to manage road systems that are safe and responsive to public needs and desires, are economically and efficiently managed, and have minimal negative ecological impacts on the land. The plans include designated areas for motorized use, prohibition of some uses to protect resources, or limitations on road use at certain times of the year for resource protection.

The WDOT's Utility Accommodation Regulation (WDOT 1990) provides the permit, encroachment, and occupancy requirements for construction and operations activities. Similar requirements apply in Utah, Colorado, and Nevada.

Other Relevant Local Roadway Requirements

Cities, counties, and other public agencies typically require an encroachment permit or similar authorization from the applicable jurisdictional agency at locations where road construction activities would occur within or above the public road ROW. The specific requirements of the encroachment permit from the applicable transportation agency would be individually determined based on Project and jurisdiction specifics. The encroachment permit issued by state and local jurisdictions may include the following requirements:

- Identify all roadway locations where special construction techniques such as night construction would be used to minimize impacts to traffic flow;
- Develop circulation and detour plans to minimize impacts to local street circulation, which may include the use of signing and flagging to guide vehicles through and/or around the construction zone;
- Schedule truck trips outside of peak morning and evening commute hours;
- Limit lane closures during peak hours to the extent possible;
- Include detours for areas potentially affected by Project construction;
- Install temporary traffic control devices as specified in the *Manual of Uniform Traffic Control Devices for Streets and Highways* (FHWA 2009); and
- Store construction materials only in designated areas.

Encroachment permit requirements would be specified by the agency having jurisdiction. Enforcement of the terms of an encroachment permit would reduce impacts associated with road closures.

3.16.1.2 Railroads

The Wyoming Transportation Commission, the Utah Public Service Commission, and the Colorado and Nevada Public Utilities Commissions each oversee railroad operations and operators in their respective states. These entities make public decisions involving railroad safety matters. Specific procedures and standards apply in each state for shared corridor operations and modifications of at-grade crossing.

The National Electrical Safety Code (NESC) (IEEESA 2011) sets policies for practical safeguarding of persons during the installation, operation, or maintenance of electric supply and communication lines and associated equipment. Any railroad/overhead utility crossing interaction would conform to NESC requirements and applicable code requirements. Key requirements include the following four items.

1. Poles or other structures supporting power must be 50 feet from the centerline of main running tracks, centralized traffic control (CTC) sidings and heavy tonnage spurs. Pole location adjacent to industry tracks must provide at least a 30-foot clearance from the centerline of track when measured at right angles. If located adjacent to curved track, then said clearance must be increased at the rate of 1.5 inches per degree of curved track.
2. Regardless of the voltage, un-guyed poles shall be located a minimum distance from the centerline of any track equal to the height of the pole above the ground line plus 10 feet. If guying is required, the guys shall be placed in such a manner as to keep the pole from leaning or falling in the direction of the tracks.
3. High voltage poles and structures (345 kV and higher) must be located outside of railroad ROW.
4. Crossings must not be installed under or within 500 feet from the end of any railroad bridge, or 300 feet from the centerline of any culvert or switch area.

3.16.1.3 Airports

Airports require clear zones for aviation safety. Clear zones vary according to airport activity and the types of aircraft operating at a particular airport. Large airports and military facilities have more extensive requirements than smaller airports and smaller landing strips.

Clear zone requirements typically involve a three dimensional space free of aviation obstacles. In some areas, guy wires, towers, transmission lines, tall buildings and other possible aviation hazards are marked, lighted and/or charted based on Federal Aviation Administration (FAA) requirements. FAA requirements also cover an airport's radar, flight control instruments, flight paths and other fundamental aspects of airport operations and safety. Standards are applied along with customization to address actual conditions at individual airports.

Locations where potential air space obstruction hazards would be constructed may require submittal of a "Notice of Proposed Construction or Alteration" to the FAA based on criteria contained in 14 CFR 77, titled "Objects Affecting the Navigable Air Space." FAA requirements set forth in Advisory Circular AC 70/7460–2K, titled "Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace," provide information to persons proposing to erect or alter an object that may affect navigable airspace and corresponding notification and review requirements. Overhead transmission lines and their supporting structures are subject to these requirements (FAA March 2000) which are summarized as follows:

- The FAA must be notified if a proposed action involves construction or alteration exceeding 200 feet above ground level and construction or alteration within:
  - 20,000 feet (approximately 4 miles) of a public use or military airport that exceeds a 100:1 sloping surface from any point on the runway of each airport with at least one runway more than 3,200 feet;
  - 10,000 feet (approximately 2 miles) of a public use or military airport that exceeds a 50:1 sloping surface from any point on the runway of each airport with its longest runway no more than 3,200 feet;
  - 5,000 feet of a public use heliport that exceeds a 25:1 sloping surface;
- A "No-hazard Declaration" is required by the FAA if a structure is more than 200 feet in height according to the FAA Act of 1958 (FAA 2011) (PL 85-726) (14 CFR 77); and
- The applicable FAA Regulation for landing strips for agricultural and other aviation purposes is FAR Part 157. These airports may or may not be shown on the FAA sectional charts.

3.16.1.4 Military Airspace Operating Areas

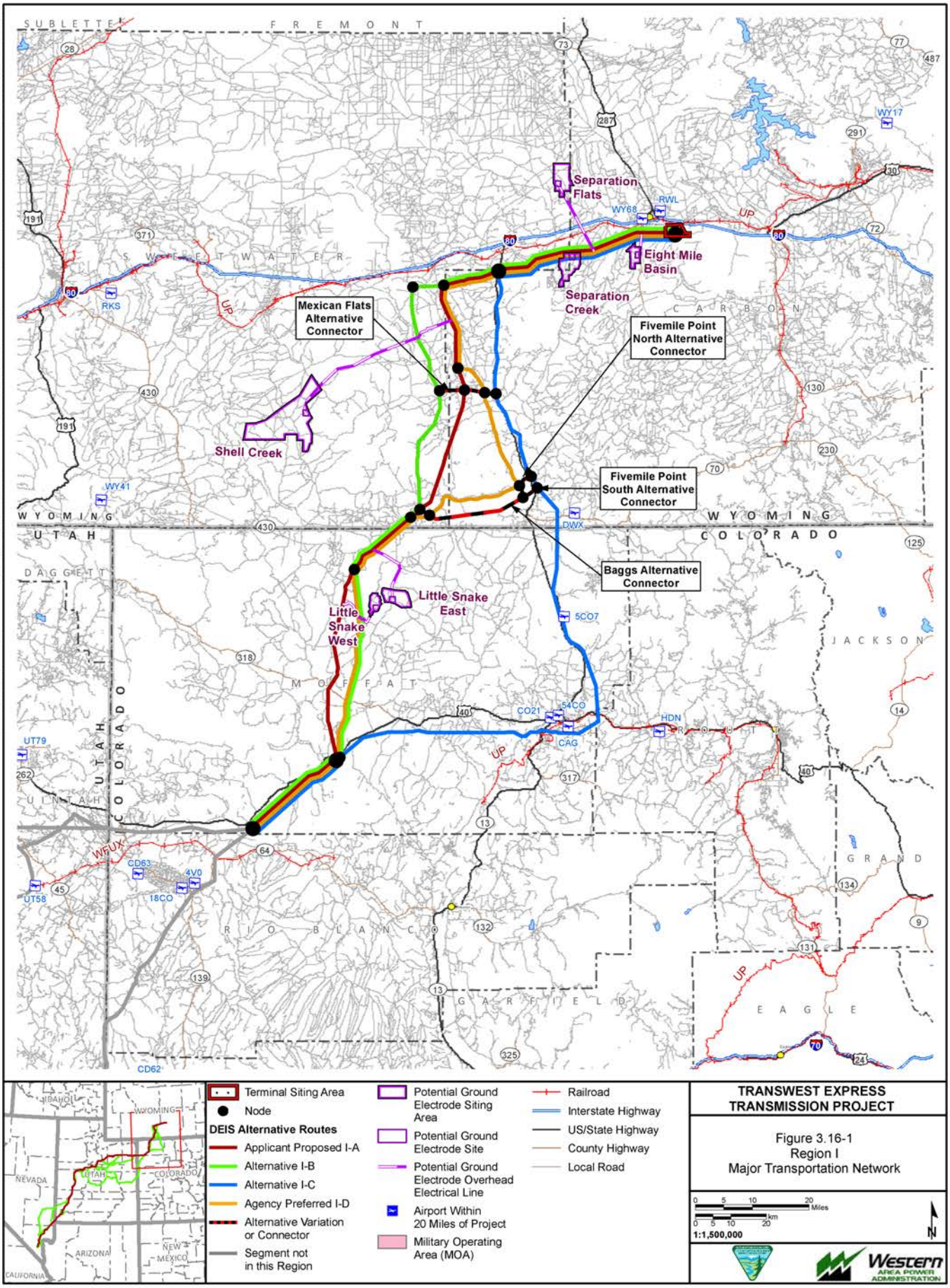
Additional requirements are applicable at military sites and within military operating areas (MOAs) and military training routes (MTRs). Unlike public airports, military operations often include large areas surrounding their airports and operations for testing, training, and other purposes well beyond the military airport areas' landing and takeoff boundaries. These areas are given special airspace designations linked to corresponding military operations. A Section 1101 Air Space Permit is required for air space construction clearance according to the FAA Act of 1958 (PL 85-726) (14 CFR 77).

3.16.2 Data Sources

The information and maps presented in this discussion were compiled from various Project documents, state and federal documents, regulations, and guidelines. Some of the baseline map information was derived from the U.S. DOT, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Additional baseline map information was derived from the U.S. Census TIGER/Line data and other federal data sources.

3.16.3 Analysis Area

The analysis area for the alternatives has two components. The first component is the overall area defined by the national, state and local road and railroad transportation network serving the alternative routes. This area is characterized in the figures that show the overall corridor from Wyoming to Nevada (**Figures 3.16-1** through **3.16-4**). The second component is composed of smaller, more focused areas defined by specific interconnections between the larger road, railroad and airport networks and individual transportation facilities and activities that cross or otherwise connect with or relate to alternatives and associated features. The smaller areas typically include improved and unimproved routes within the local roadway network, railroads, airports, and controlled airspaces. The roads within this portion of the analysis area are considered the Project "backbone" roads. **Figure 3.16-5** and **Figure 3.16-6** provide examples of the local roadway network (road density, distribution, and type) to generally characterize the second component of the analysis area. The following discussions address both components of the analysis area.


Separation Flats
Eight Mile Basin
Separation Creek
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Shell Creek
Fivemile Point South Alternative Connector
Baggs Alternative Connector
Little Snake East
Little Snake West
SUBLETTE
FREMONT
SWEETWATER
CARBON
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
JACKSON
GRAND
RIO BLANCO
GARFIELD
EAGLE
UINTAH
WFUX
UP
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Airport Within 20 Miles of Project
Military Operating Area (MOA)
Railroad
Interstate Highway
US/State Highway
County Highway
Local Road
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.16-1
Region I
Major Transportation Network
1:1,500,000
Western AREA POWER ADMINISTRATION
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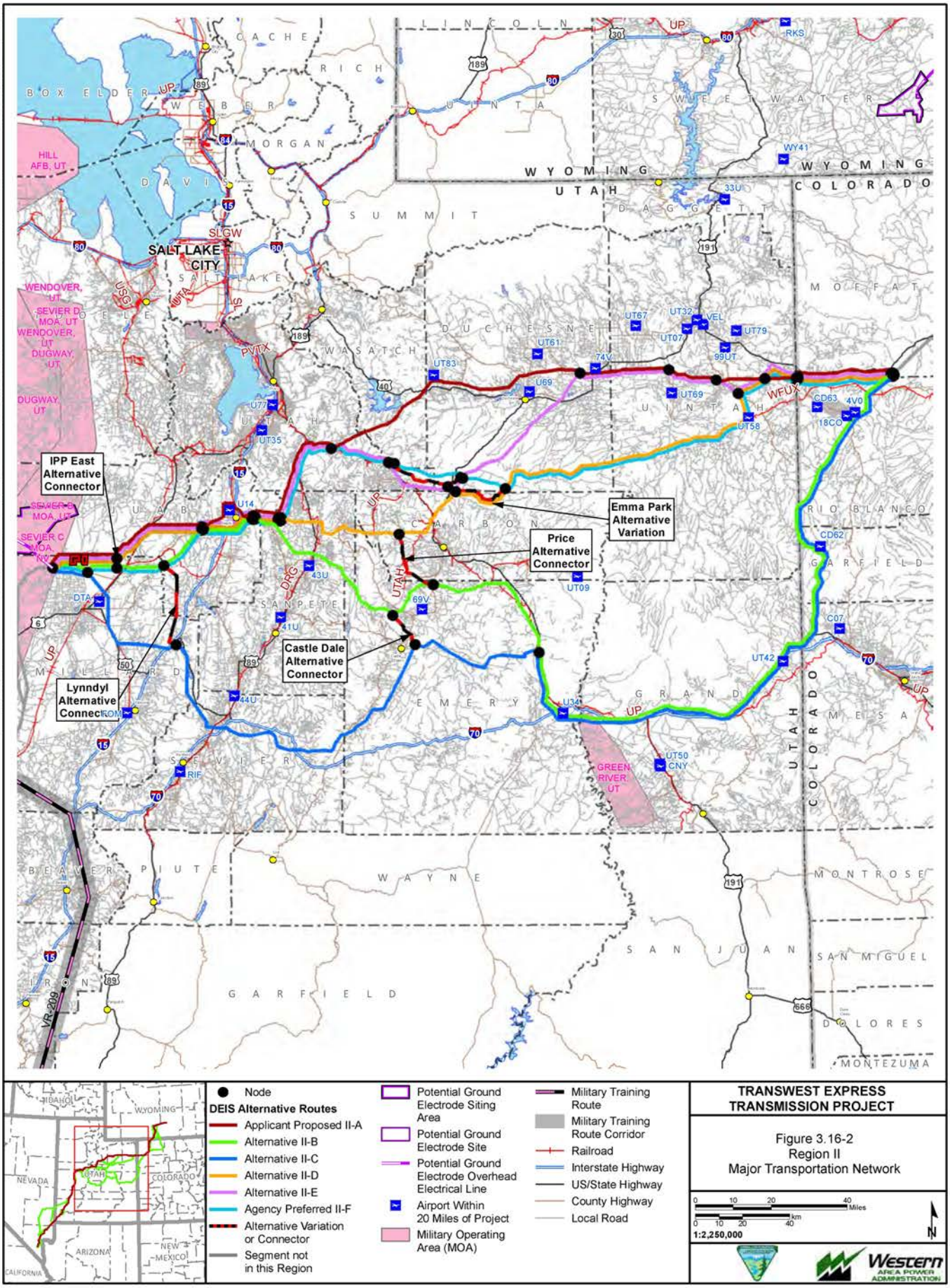

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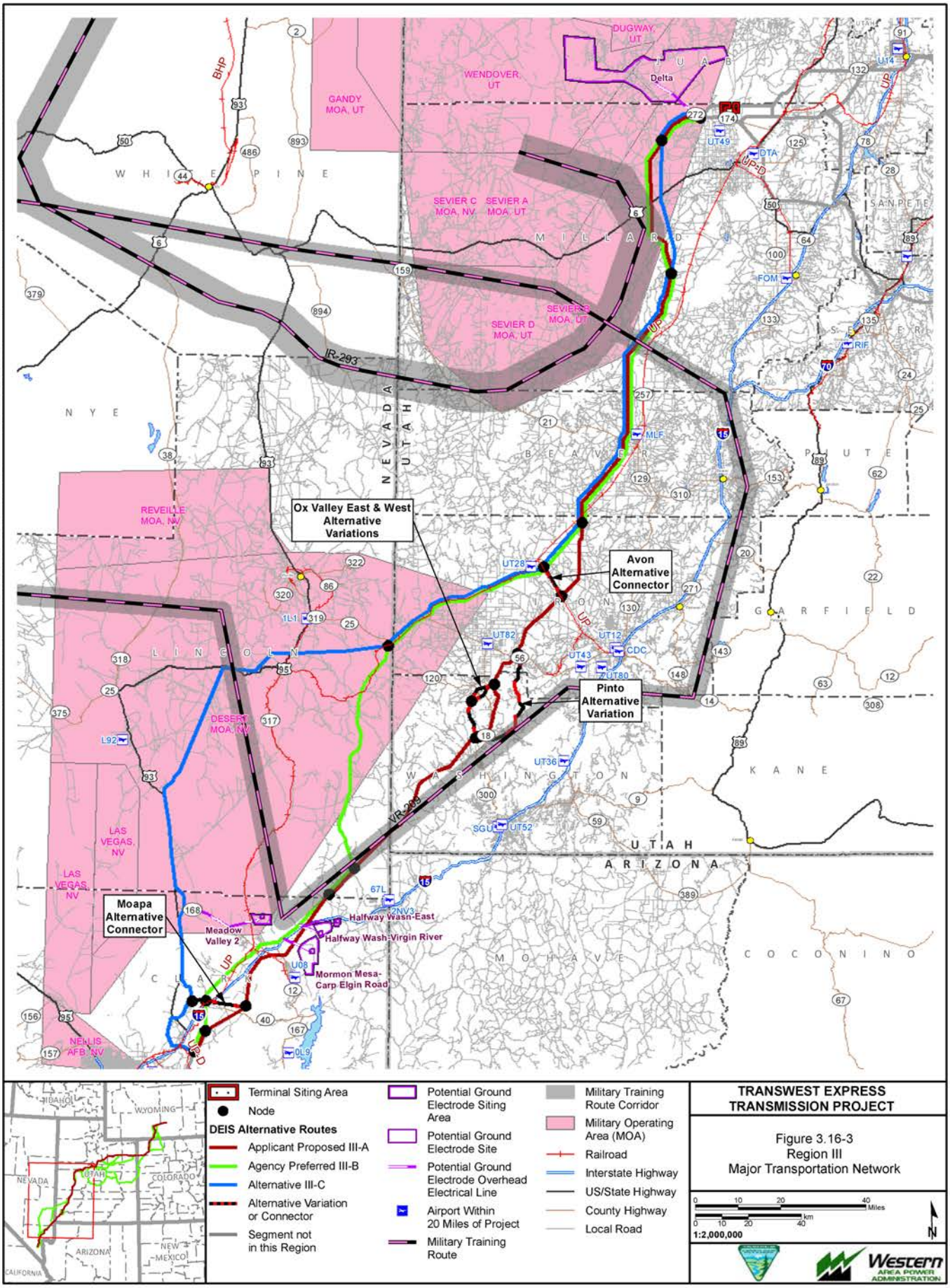

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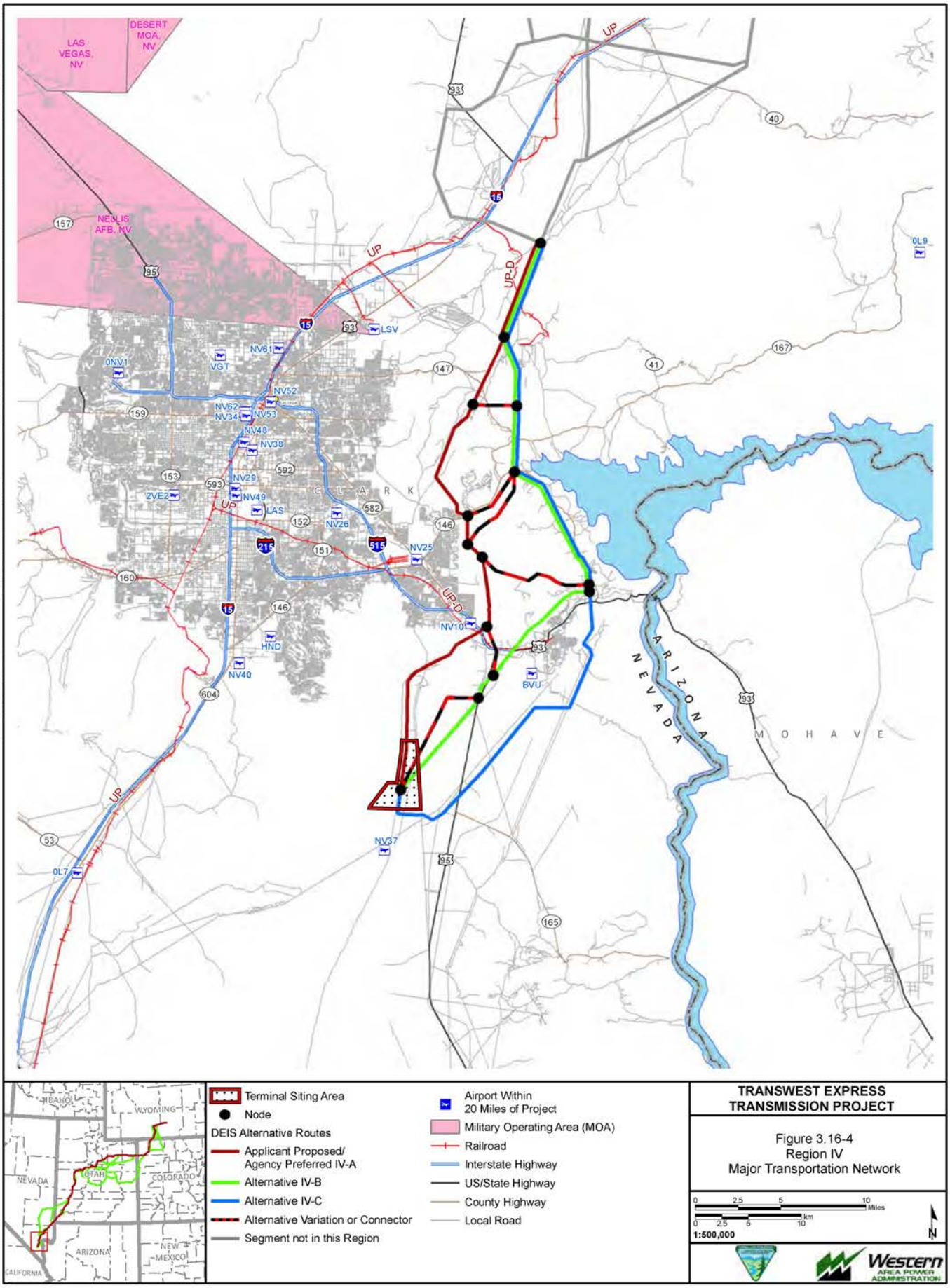

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.16-4
Region IV
Major Transportation Network

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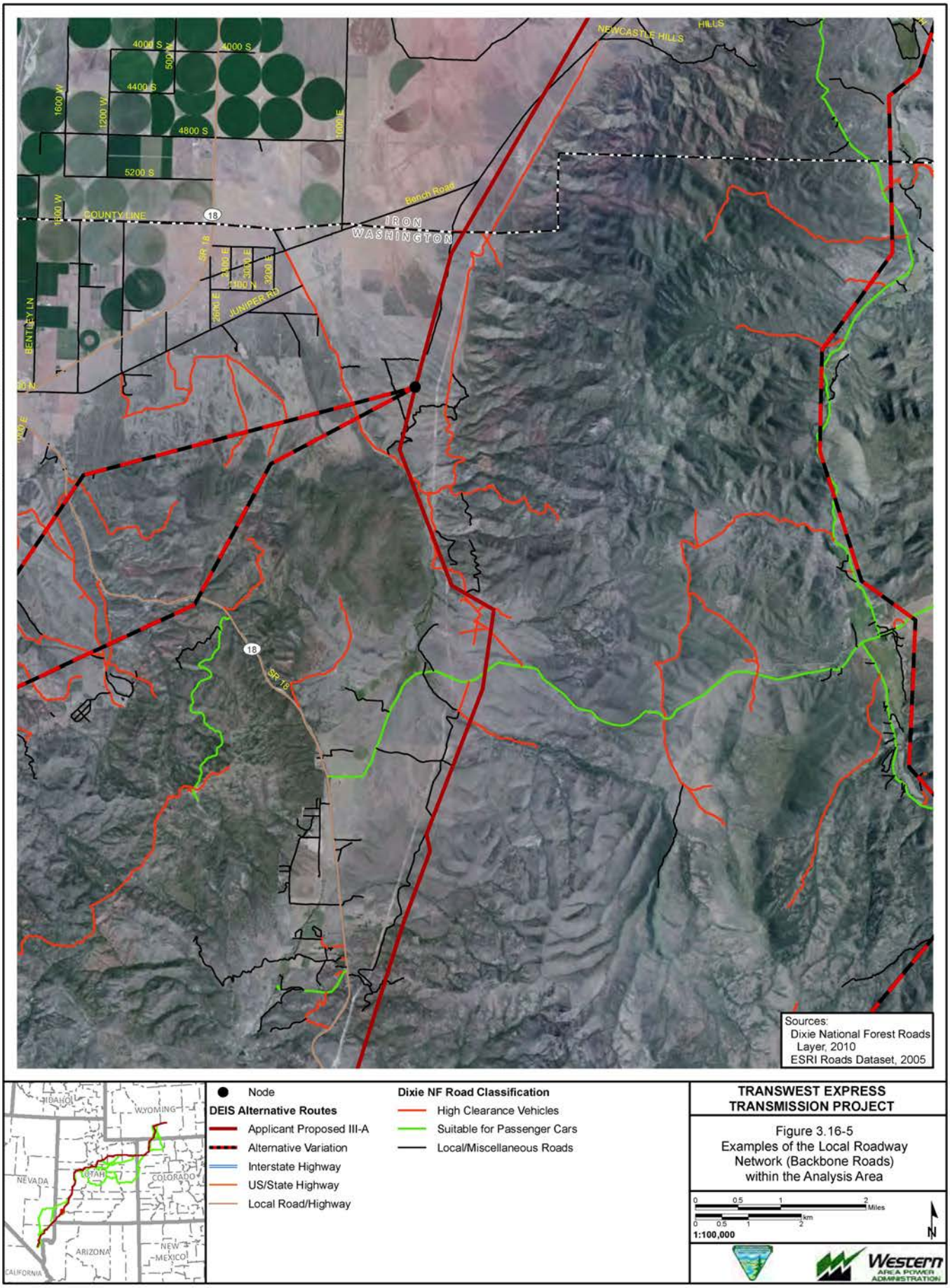

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.16-5
Examples of the Local Roadway Network (Backbone Roads) within the Analysis Area

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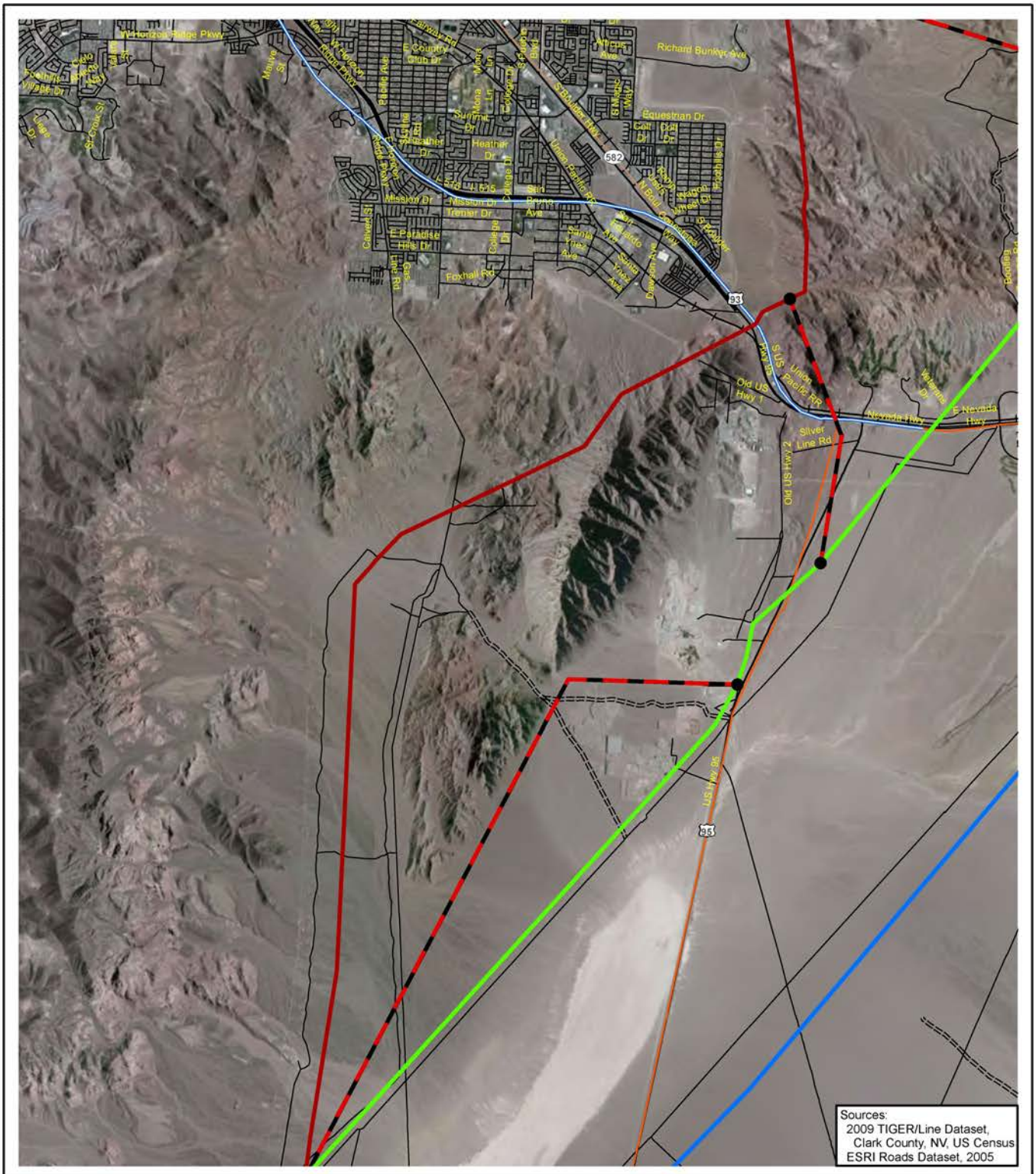

Node

DEIS Alternative Routes

- Applicant Proposed/ Agency Preferred IV-A
- Alternative IV-B
- Alternative IV-C
- Alternative Variation or Connector

- Interstate Highway
- US/State Highway
- Local Road/Highway

TIGER/Line Classifications

- Primary Road
- Secondary Road
- Local Road
- Vehicular Trail (4WD)
- Railroad

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.16-6
Examples of the Local Roadway Network (Backbone Roads) within the Analysis Area

0 0.5 1 2 Miles
0 0.5 1 2 km
1:100,000
N

Western AREA POWER ADMINISTRATION

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3.16.4 Baseline Description

3.16.4.1 Roads

Roadway Network

The interstate system, U.S. highways, and state highways provide national and state routes through the analysis area for automobiles and trucks. These roads can support high travel speeds and traffic volumes by meeting specific state and federal design standards.

The local roadway networks serving the analysis area provide higher levels of access within the analysis area. Local roads in the analysis area are designed to carry lower volumes at lower speeds than federal and state roads. Some portions of the analysis area have extensive local roadway networks (urban and suburban areas), while other portions of the analysis area have few to no local roads (rural and remote areas). Roadway types located within the analysis area include major and minor arterials and collectors, and unpaved roads.

Local roadway conditions characterize different accessibility and terrain conditions found within the overall Project corridor and can be classified into four categories:

- Urban-Flat;
- Suburban-Rolling;
- Rural-Steep; and
- Remote-Mountainous.

Each condition within the analysis area presents specific and unique transportation and access issues and challenges. For example, issues and challenges associated with developed or relatively flat areas with established roadway networks frequently involve the potential for residential and business access constraints, congestion, and deficient intersection design and operations.

Issues and challenges involving undeveloped areas and/or steeper terrain and unimproved roads are often linked to construction complexity (sharp horizontal and vertical curves), safety features (sight distance and speed control), and maintenance considerations (road and slope stability based on geology, geotechnical factors, and drainage/stormwater control features like culverts and ditches). Unimproved roads present ongoing maintenance requirements for public agencies. Typical maintenance requirements include grading and adding roadbase to smooth travel surfaces. These activities are highly dependent on factors such as use characteristics, slope, and weather conditions. Maintenance requirements can be increased by higher than normal travel volumes and the use of these roads by heavy trucks.

The use of, or modification to, existing roadways and the construction of new roadways require direct interaction with local public agencies responsible for these roadways and adherence to applicable local, state and federal standards and requirements.

Project Roadway Accident Statistics

Each State in the analysis area has its own method of collecting and reporting crash data and statistics. Most DOTs report four types of data: total, property damage only, injury, and fatal crashes. Accident type, factors involved, and driver demographics also may be included. A high level or summary analysis of crash data was performed on individual roadways or county areas to characterize the affected environment of the Project analysis area.

WDOT published the *Wyoming FY2012 Problem Identification* (WDOT 2012). From the report, based on 2008 to 2010 crash information, a highway safety index state ranking system was established. Crash information was reported by county.

CDOT reports crash data based on individual roadways. Data provided by CDOT are plotted on safety performance functions, which are specific to rural or urban, terrain type and number of lanes. The safety performance function consists of the annual average daily traffic (AADT) vs. Accidents per Mile per Year graph containing data points from similar roadway types throughout the state of Colorado. Depending on where the specific roadway data point falls on the graph gives a general indication if the roadway's crash data are within an expected range (CDOT 2005).

UDOT provides crash data by county. There are 13 counties in the analysis area within Utah: Beaver, Carbon, Duchesne, Emery, Grand, Iron, Juab, Millard, Sanpete, Sevier, Uintah, Utah and Wasatch. The *Utah Crash Summary 2010* (Utah State Department of Public Safety 2010) ranks each county on total crash rate per 100 million vehicle miles traveled as well as providing a county-by-county highway safety ranking.

NDOT also provides crash data by county. The analysis area involves two counties, Clark and Lincoln (NDOT 2011).

Accident statistics for unimproved local roadways are not readily available or consistent. Key safety issues often involve vehicles operating at unsafe speeds given road conditions, mixing several vehicle classes (passenger cars, motorcycles, trucks and slow/wide construction vehicles), poor lighting or drainage conditions, and limited sight distance.

<u>Public and Private Access Conditions involving Local Roadways</u>

The local roadway network exists to provide access to public and private property. These roads also connect communities and provide access to natural resources, recreation areas, and utility corridors. Depending on location, access may be available at all times and in other areas, access is limited or prohibited. Private property may be served by public and/or private roads. Public property is primarily served by public roads, but there are some exceptions based on specific agreements (easements) between landowners and land management agencies. Most private roads do not provide public access and may or may not be gated to limit unauthorized travel.

3.16.4.2 Railroads

Roads, railroads, transmission lines, and other uses of utility corridors often follow common parallel alignments, often crossing one another. The use of a common corridor and railroad crossings in general present potential safety issues and risks routinely addressed throughout the country.

3.16.4.3 Airports

Based on proximity of the Project to existing airports, some of these airports and their operations present the potential for safety considerations.

3.16.4.4 Military Airspace Operating Areas

The major military facilities in the analysis area include:

- Nevada Test and Training Range (NTTR);
- Utah Test and Training Range (UTTR); and
- Utah Launch Complex/White Sands Missile Range near Green River, Utah.

The NTTR, affiliated with Nellis Air Force Base (AFB), Creech AFB, and Luke AFB, includes special designations for Low Altitude Tactical Navigation airspace and emergency aircraft evacuation/ejection areas within the analysis area. These designations and related details are set forth in a Letter of Agreement between the U.S. Air Force (USAF) and BLM (USAF-BLM 2005). The details of the Letter of Agreement are presented here: http://www.airspacecoordination.org/coord/nellis_LOA.pdf.

WWEC and other utility corridors pass through the NTTR and the Desert MOA. Refer to **Figures 2-3** and **3.16-3** for the boundaries of the Desert MOA. The flight "altitude floors" are set at 100 feet above-ground level (AGL) within the Desert MOA. However, WWEC Final EIS and RMP utility corridors exist within the surface area boundaries of the Desert MOA.

The NTTR involves almost 3 million acres of land and is a valuable military aviation and economic resource. The NTTR is Air Combat Command's largest complex with 3 airfields, 2 ranges, and 10 other sites providing 12,000 square nautical miles of airspace (MacNeill 2012). MTR VR-209 passes through the NTTR as shown in **Figure 3.16-3**. Special Operating Procedure (9) states "Caution: Watch for power lines…" The importance of Special Operating Procedure (9) is that military pilots using VR-209 are currently informed about the presence of power lines.

The UTTR, affiliated with Hill AFB, also is in the analysis area. Like the NTTR, the UTTR is a valuable military aviation and economic resource. The Hill AFB Sevier A and C MOA and the Hill AFB Sevier B and D MOA involve routine and low-risk training and testing. The UTTR was designated in 1979 specifically to support cruise missile testing, which is ongoing. The Hill AFB Sevier A and B MOA restrictions address low altitude flights. The flight altitude floors are set at 100 feet AGL within the Hill AFB Sevier A and B MOAs. The UTTR supports approximately 1,200 sorties annually that train in the 100-foot AGL regime. There are few places in U.S. airspace that allow flights to this low altitude other than UTTR and NTTR. The Hill AFB Sevier C and D MOAs occur above the A and B MOAs and address aircraft operations at higher altitudes. However, WWEC Final EIS and RMP utility corridors exist within surface area boundaries of the Hill AFB Sevier MOAs. MTR VR-209 and MTR IR-293 pass through the UTTR as shown in **Figure 3.16-3**. Minimum (flight) altitudes are established to provide at least 100 feet vertical clearance of known man-made obstructions within the route width. Obstructions under 200 feet AGL were not considered in route design.

At Hill AFB, most of the operations require use of air space and training includes a great deal of interaction with ground forces. The UTTR has approximately 13,000 square nautical miles of air space, about half of which is MOA and half is restricted air space (EGS/TWE 2009).

WWEC and other utility corridors pass through the UTTR (see **Figure 2-4** through **2-7** and **Figure 3.16-3**). A moratorium on planning from the 2000 Defense Act states that no planning would occur on public lands under the jurisdiction of the BLM in the State of Utah that are adjacent to or near the UTTR and Dugway Proving Ground or beneath the MOAs, Restricted Areas, and airspace that make up the UTTR. If the alternatives and/or the associated features are proposed on federal lands "adjacent to, near or beneath" an MOA a Resource Management Plan Amendment is required (Ashcroft 2011; BLM 1985).

The moratorium on planning would only apply if an RMP Amendment is required based on a lack of conformance with the existing land use plan. A Project can be sited "adjacent to, near or beneath" a MOA as long as it conforms to the existing RMP.

The Utah Launch Complex/White Sands Missile Range currently is not used for military air space operations. However, the U.S. Department of Defense may use this site in the future for military air space operations or other operations. WWEC Final EIS, RMP, and LRMP utility corridors pass through the northern end of the site (see **Figure 2-4** through **2-7** and **Figure 3.16-2**).

3.16.5 Regional Summary

Table 3.16-1 indicates the major transportation network infrastructure in the analysis area summarized by Project region and includes major roadways, railroads, and airports. **Figures 3.16-1** through **3.16-4** depict the transportation infrastructure by Project region.

Table 3.16-1 Major Transportation Network Infrastructure by Project Regions

Region	Interstate Highways	U.S. Highways	State Highways	Railroads	Airports
I	I-80	30, 40, 191, 287	13, 45, 70, 88, 318, 430, 789	Union Pacific WFUX	Rawlins, Wyoming; Craig, Colorado
II	I-15, I-70	6, 40, 50, 89, 191	10, 24, 28, 35, 64, 87, 89, 125, 132, 135 139, 174, 208, 260	Union Pacific WFUX	Delta, Utah; Price, Utah; Nephi, Utah; Vernal, Utah; Green River, Utah
III	I-15	6, 50, 89, 93, 95, 189	21, 56, 78, 147, 168, 169, 219, 257, 319	Union Pacific	Delta, Utah; Milford, Utah; St. George, Utah; Cedar City, Utah
IV	I-15 I-215 I-515	93, 95	147, 564	Union Pacific	McCarren International, Las Vegas, Nevada

3.16.5.1 Roadways

Roadway Network, Access and Terrain Conditions

The level of road development, public and private property access and topography vary considerably in each of the Project regions. However, regional road network, local access, applicable standards, congestion, and safety conditions are similar within the four regions of the analysis area. Conditions in Region IV generally are more developed resulting in more congestion and safety issues; however, the terrain is less steep than in the other Regions.

Capacity

The Highway Capacity Manual (Transportation Research Board 2010) is used to estimate a volume-to-capacity (v/c) ratio. Volume-to-capacity ratio is the hourly volume (in passenger car equivalent) divided by the hourly capacity of the roadway being analyzed. Operating at or near capacity (depending on the agency) is considered a failure. The key data inputs for estimating a v/c ratio include: hourly traffic volume, number of lanes, terrain type and percentage of trucks.

Peak hour volumes were estimated from the AADT volumes provided by State DOTs and the number of lanes corresponding to the AADT were recorded. In all cases, the terrain type was considered rolling and a traffic volume consisting of 12 percent trucks was assumed. These assumptions generally match analysis area characteristics. State DOTs provided AADT volumes for interstates and state highways. Data were collected from 2009 or later for the major roadways listed previously at or near locations where access may be needed and where crossings may occur. For all major roadways within the analysis area (all states), the volume-to-capacity ratio during the peak hour is estimated to be 0.35 or better (i.e., all roadways are operating at 35 percent of their capacity).

In some locations within the analysis area, past, ongoing and anticipated activities have added, add or would add “unusually” high levels of traffic to a particular local roadway network. This traffic is associated with construction, operation and/or maintenance of various types of industrial projects (pipelines, power transmission lines, telecommunication lines, oil and gas exploration and production,

mining, power generation (coal, solar, and wind), road construction, and resource management activities such as timber harvest, fire suppression and burn area rehabilitation. These activities typically increase travel on the road network during finite construction periods or in some cases for extended periods associated with facility operations or both. This traffic, in combination with baseline traffic levels, can create congestion, safety, and/or road maintenance issues during the overlapping timeframes.

The cumulative impact analysis presented in Chapter 5.0 identifies past, present and reasonably foreseeable projects within the analysis area.

Accident Rate Conditions by State

Accident information is generally compiled and reported by States. The Project regions relate to state boundaries as follows:

Region I	Wyoming, Colorado and Utah
Region II	Colorado and Utah
Region III	Utah and Nevada
Region IV	Nevada

The following information presents accident conditions by State.

Wyoming: The statewide safety index average is 12.0 with 1.0 being the worst rank. Roadway accident statistics for Wyoming indicate that Carbon, Fremont, and Sweetwater counties have a total ranking safety index of 12.60, 6.00, and 10.20, respectively. According to this ranking, Fremont and Sweetwater counties fall below the statewide average and Carbon County is slightly above the statewide average (WDOT 2012).

Colorado: Based on crash information in Colorado provided by CDOT, all roadways in the analysis area are within the expected range, except SH 13 near Craig, Colorado (CDOT 2005).

Utah: Out of the 13 counties analyzed, all rank safer than the statewide average based on crash rate per 100 million vehicle miles traveled except Utah and Duchesne counties. The State of Utah has a second way of evaluating safety using additional criteria. Based on this county highway safety ranking, Duchesne, Wasatch, Uintah, and Utah counties fall below the safety ranking average, meaning the roadways are less safe than the average roadway.

Nevada: Based on data provided by NDOT from 2008 to 2010, Clark County has a higher total crash rate per 100 million vehicle miles traveled than the state average. This is expected since Las Vegas is located in the county and urban crash rates tend to be higher than average. Lincoln County has a lower total crash rate than the statewide average (NDOT 2011).

3.16.5.2 Railroads

More railroad tracks are found in Region IV than in the other regions. Railroad density is the highest in the northwestern portion of Region IV.

3.16.5.3 Airports

Airports are distributed throughout the analysis area, but cluster in the urban area within Region IV. Region I has the fewest airports.

3.16.6 Impacts to Transportation and Access

This section of the EIS describes potential impacts of the alternatives on the national, state, and local transportation networks serving the Project analysis area. The discussion covers impacts on roads, railroads and airports. One primary focus of this analysis is on access road construction requirements and their impacts on transportation and access.

The analysis area for the alternatives and their associated features has two components. The first component is the overall area defined by the national, state and local road and railroad transportation network serving the alternatives. The second component is composed of smaller, more focused areas defined by specific interconnections between the larger road, railroad and airport network and individual transportation facilities and activities that cross or otherwise connect with or relate to the alternatives and their associated features. The smaller areas typically include improved and unimproved routes within the local roadway network, railroads, airports, and controlled airspaces. The roads within this portion of the analysis area are considered the Project "backbone" roads. In general, the overall width of the second component of the analysis area ranges from 2 to 5 miles split evenly from the alignment centerlines. The following discussions address both components of the analysis area.

Key transportation and access impact issues raised in the scoping process included concerns about the following topics:

- Road construction requirements to provide access to the 250-foot-wide transmission line ROW and the features of the associated alternatives; and
- Increased traffic volumes on local roads and related impacts on access, safety, and road maintenance.

Transportation and access concerns in the analysis area and issues addressed in this section of the EIS include:

- Expansions of the local roadway network, trip generation and related impacts on capacity/congestion, travel time, access, and safety;
- Transmission line railroad crossings and related safety issues;
- Transmission line proximity to airports and associated safety issues; and
- Transmission line proximity to military airspace operation areas.

Traditional transportation planning and analysis methods are applied to characterize potential impacts. However, a special programmatic methodology was employed to determine the miles of access road construction requirements and to assess their impacts (see Chapter 2.0 and **Appendix D**).

A programmatic methodology was developed to estimate miles of new access roads, differentiating between required access roads both inside and outside the 2-mile transmission line corridor. In addition, four terrain types (flat, rolling, steep, and mountainous) were considered to determine different road improvement needs along the routes. The methodology used the results obtained from the 18 example segments and the slope of the 250-foot-wide transmission line ROW to estimate miles of new access roads required for every transmission line segment. The segment totals were then aggregated to create a total number of access road miles needed for each alternative in each Region. Access road miles along with other metrics were used to make comparisons between the alternatives. This programmatic methodology and the results were reviewed and approved by the EIS Project team for use in the Draft EIS analysis.

Route-specific Road Access Plans would be developed for the Agency Preferred Alternative once the Agency Preferred Alternative is determined (TWE-6). Each Road Access Plan would be composed of a map defining the 250-foot-wide transmission line ROW, structures (towers) and right of way, and the requirements of the backbone access network (roadway routes to the transmission line). The backbone access network requirements would define existing routes that do not require improvements, existing routes that require improvements, and new routes to be constructed. The surface type (gravel, paved or other) and terrain type (flat, rolling, steep and mountainous) also would be defined. The overall set of Road Access Plans for the Agency Preferred Alternative would be used to refine the impacts analysis for the Agency Preferred Alternative and to define location-specific mitigation measures, as needed. Public agencies responsible for roads within the backbone access network would use the Road Access Plan to develop appropriate conditions for use of each road during their individual permit review processes.

West Wide Energy Corridor Final Programmatic EIS Best Management Practices (TRAN-1, TRAN-2, TRAN-3, and TRAN-4 from **Appendix C**) supplement the Road Access Plan development process:

> TRAN-1: The applicant shall prepare an access road siting and management plan that incorporates relevant agency standards regarding road design, construction, maintenance, and decommissioning. Corridors would be closed to public access unless determined by the appropriate federal land manager to be managed as part of an existing travel and transportation network in a land use plan or subsequent travel management plan(s).
>
> TRAN-2: The applicant shall prepare a comprehensive transportation plan for the transport of transmission tower or pipeline components, main assembly cranes, and other large equipment. The plan should address specific sizes, weights, origin, destination, and unique equipment handling requirements. The plan should evaluate alternative transportation routes and should comply with state regulations and all necessary permitting requirements. The plan should address site access roads and eliminate hazards from truck traffic or impacts to normal traffic flow. The plan should include measures such as informational signage and traffic controls that may be necessary during construction or maintenance of facilities.
>
> TRAN-3: Applicants shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) should be identified and addressed in the traffic management plan.
>
> TRAN-4: Additional access roads needed for decommissioning shall follow the paths of access roads established during construction to the greatest extent possible; all access roads not required for the continued operation and maintenance of other energy systems present in the corridor shall be removed and their footprints reclaimed and restored.

In addition, BMPs dealing directly with process requirements (compliance with applicable laws, regulations, agency stipulations, and the requirements of the ROD) and specific impact issues further supplement the Road Access Plan development process (see **Appendix C**). Examples of BMPs directly related to transportation and access issues include:

> All new roads would be designed and constructed to a safe and appropriate standard, “no higher than necessary” to accommodate intended vehicular use. Roads would follow the contour of the land where practical.
>
> Construction would be scheduled for slower times of visitation during the week and slower seasons to minimize the impacts of construction traffic on public access.

Newly permitted routes would be obliterated and/or returned to their original condition when they no longer serve their permitted purpose or public interest.

The alternative requiring the most miles of road construction would have the most impact on the roadway network by improving and extending the network and resulting road access, along with creating new permanent disturbance. In addition, this alternative would require the highest level of new road maintenance and would increase safety and access impacts, especially in areas with steep and mountainous terrain.

The analysis applies miles of roadway building as a comparative metric along with other metrics such as:

- Roadway capacity relative to anticipated vehicle trip generation;
- Proportion of public vs. private land crossed by the transmission line;
- Number of major road crossings;
- Number of railroad crossings;
- Proximity to airport flight patterns; and
- Proximity to military airspace operating areas.

The expansion of the roadway network for Project purposes increases the transportation network with associated impacts on resources such as vegetation, soils, water quality, and wildlife habitats. Impacts to other resources from access road construction are discussed in the respective resource sections of this chapter. Impacts from Project development on the existing transportation network are addressed in this section of the EIS.

Table 3.16-2 presents a summary of resource topics, analysis considerations, and relevant assumptions.

Table 3.16-2 Relevant Analysis Considerations for Transportation and Access

Resource Topic	Analysis Considerations and Relevant Assumptions[1]
Road Construction: Enhancements to the Local Roadway Network	Analyze road construction requirements using a special methodology that defines miles of new road by terrain type to establish local roadway network enhancements. Major assumptions include road improvements expand the existing roadway network and improve travel conditions after completion; Road Access Plans would be developed for the Agency Preferred Alternative; and road improvements would comply with applicable design and construction standards and permit requirements (refer to TRAN-1, TRAN-2, TRAN-3, and TRAN-4). Additional technical assumptions also were used to derive anticipated access road miles.
Road Safety	Evaluate road safety in relation to additional miles of new roads and road use involving terrain types, especially steep and mountainous. The major assumption involves linking slow moving vehicles and vehicles traveling on steep and mountainous roads with limited sight distance and other factors to characterize overall potential safety risks.
Road Maintenance and Load Limits	Evaluate road maintenance in relation to addition of miles of steep and mountainous roads and road use estimates by Project vehicles. The major assumption is that new road miles, especially steep and mountainous roads and trip generation, coupled with an evaluation of existing load limits, are reasonable metrics for assessing potential future road maintenance requirements.

Table 3.16-2 Relevant Analysis Considerations for Transportation and Access

Resource Topic	Analysis Considerations and Relevant Assumptions[1]
Trip Generation, Roadway Capacity and Congestion	Analyze construction, operation, maintenance, and decommissioning of the proposed alternatives and associated facilities in terms of maximum daily trip generation. Major assumptions used in the analysis are construction descriptions and schedules presented by the Project proponent.
Access	Evaluate the potential for public and private property access disruption due to roadway construction. It is assumed that the relative impacts on public and private access are characterized by evaluating the proportion of public and private land traversed by the transmission lines. Issues associated with restricted access are addressed in Sections 3.13, Recreation Resources, and 3.14, Land Use.
Transmission Line Installation over Major Roads and Railroads	Determine the number of major roadway (e.g., interstate highways, U.S. highways, state highways) and railroad track crossings to assess the overall potential for travel delays. It is assumed that temporary traffic delays and/or detours may occur when materials, equipment, and transmission lines are installed over these travel corridors.
Airport and Related Military Airspace Operation Area Conflicts	Determine the number of airports and controlled airspace areas within 5 miles of the alternatives and associated facilities to assess the relative air navigation hazard impacts by alternative. It is assumed that transmission towers and conductors within 5 miles of an airport or designated air space area may increase air navigation hazards during and after construction and that the addition of tower and conductors within Military Airspace Operating Areas outside of existing utility corridors present substantial conflicts.

[1] **Appendix C** identifies design features (proponent commitments) to decrease impacts, and RMP stipulations, specific to each BLM Field Office or Forest Service Forest, to avoid or decrease Project impacts (Refer to TRAN-1 through TRAN-8, and others).

Trip generation rates were developed for the construction, operation, and decommissioning phases of the Project. The TWE PDTR included a 2.5-year construction schedule and workforce information for the overall transmission line and individual tasks to complete the Project. Each task was given an approximate duration, sequence, and workforce needed, in terms of people and vehicles/equipment. The estimates were reported for a typical 20-mile section of transmission line.

The duration of transmission line construction activities involving any given parcel of land may extend up to 1 year, although the total amount of time of actual construction activity would be much shorter, in the range of a few months. Over any particular section of the route, transmission line construction would be characterized by short periods (ranging from 1 day to 1 to 2 weeks) of relatively intense activity interspersed with periods with no activity. Typical work days would be Monday through Saturday, 7am to 7pm.

Based on this information and a conservative approach, daily trip generation rates were estimated for specific construction locations that would change as progress is achieved along individual transmission line segments. It was estimated that the maximum daily trips generated from construction of the Project on a given day would be from 200 to 250 trips. These trips would vary in terms of vehicle type (automobile, small truck, large truck, and transport vehicles for 30-ton cranes).

The construction period daily trips would be distributed over 12 hours (7am to 7pm) with higher trip generation rates between 7am and 9am and 4pm to 6pm. Approximately 20 percent of the daily construction trips would be expected to occur during a 1-hour peak period. Assuming all morning and afternoon peak trips would be inbound and outbound, respectively, the total number of trips per hour would be about 50 or less than one vehicle every minute.

This conservative analysis assumes all trips would be on one road headed to one specific location along the transmission line. Under more likely conditions, these trips would be distributed to multiple

destinations over more than one access road. Also, trip generation would be considerably lower from 9am to 4pm. Many inbound vehicles would arrive and then remain on-site during the construction period and would not be outbound until construction in their location is completed.

Given these conditions, congestion would be rare, but possible where other trip generating projects or other local conditions have substantially increased travel volumes near Project-related transmission line construction. Traffic from various kinds of development (pipelines, other power transmission lines, telecommunication lines, oil and gas exploration and production, mining, power generation (coal, solar and wind), road construction, and resource management activities such as timber harvest, fire suppression and burn area rehabilitation) occurring at the same time as transmission line activities could lead to congestion, safety issues and increased maintenance requirements.

Trip generation from the operations and maintenance phase would be substantially less than the construction phase. The types of vehicles used for inspection include helicopters and 4x4 trucks and ATVs. When inspections deem repair is needed, vehicle types would vary based on actual conditions, but would be similar to the vehicle mix assumed during the construction phase.

The decommissioning phase of the Project would be similar to the construction phase. Maximum daily trip generation would range from 200 to 250 trips. Peak hour trip generation would range from 40 to 50 vehicles per hour (see **Table 3.16-3**).

Table 3.16-3 Estimated Trip Generation Relative to Roadway Capacity within the Existing Backbone Roadway Network

Roadway Type	Total Hourly Capacity	Project-related Trip Generation Percent of Total Hourly Capacity (Estimated 50 One-Way Peak Hour Trips)
Class II Highway Speed Limit: 55 mph	1750 875 in each direction	3
Local Arterial (Paved) Speed Limit: 25 - 35 mph	780 390 in each direction	6
Two Lane Gravel Road (Good Condition)	700 – 1000 350 to 500 in each direction	5 to 7
Two Lane Gravel Road (Poor to Fair Condition)	500 – 699 250 to 350 in each direction	7 - 10
Unimproved Road (Unsuitable for TransWest Construction Vehicles)	100 – 500 50 - 200 in each direction	N/A

A similar conservative approach was taken to estimate the daily trip generation rates for the construction of the Northern and Southern terminals. A draft construction schedule was broken into tasks detailing anticipated duration, employees, and vehicles required per task. Based on the construction schedule, estimated trip generation by the construction of the Northern or Southern terminals would be 400 to 450 trips per day. This assumes that every vehicle needed for a particular task enters and exits the site every day. However, it is more logical that certain vehicles would arrive when needed and be left on site until their specific duty is completed. Using this more conservative approach, it is estimated that the trips generated by the construction of the Northern or Southern terminals would be 220 to 270 trips per day.

Table 3.16-3 places the anticipated trip generation rates in perspective relative to the capacity of various roadway types within the existing backbone roadway network.

Based on the data in **Table 3.16-3**, the incremental impact of the peak hour traffic is minor on roads suitable for the anticipated Project-related vehicles and additional work is needed on key capacity issues required to improve roads that are inadequate. Five primary variables contribute to unimproved roadway adequacy:

1) Surface type;
2) Drainage;
3) Road width;
4) Width of clear zone; and
5) Road alignment rating (comfortable travel speed).

As described previously, route-specific road access plans would be developed for the Agency Preferred Alternative once it is determined. These plans would make determinations about roadway adequacy and the need for road improvements. These determinations would be checked by public agencies responsible for roads within the backbone access network. Adjustments would be made, as needed, prior to approval and corresponding mitigation would be developed for implementation during the construction and operational phases of the Project. These adjustments would include the possibility that some roadways have unusual background traffic levels from ongoing industrial or other activities and/or the possibility that another project could occur in the same place and at the same time as the TransWest Project. In these situations, the local permit process would address the Project's incremental impacts along with the added impacts of the other actions.

3.16.6.1 Impacts from Terminal Construction, Operation, and Decommissioning

The Northern and Southern Terminals are proposed within general siting areas, but the specific locations have not been finalized. Road Access Plans (TWE-6) and Access Road Siting and Management Plans (TRAN-1) and other details (TRAN-2) serving these facilities are not available at this time and the special methodology assumptions involving access requirements by terrain type have not been developed. Road Access Plans, Access Road Siting and Management Plans, and site details would be prepared and analyzed for these sites and the Agency Preferred Alternative once the sites are determined. Consequently, transportation and access impacts for the terminal sites are described in general terms.

The Northern and Southern terminals would be expected to generate approximately 220 to 270 vehicle trips per day during the construction and decommissioning phases of the Project. Far fewer trips per day would be expected during the operation and maintenance phase at these locations. Based on anticipated trip generation rates, trip distribution and site conditions, transportation and access impacts are anticipated to be similar at either site. Transportation and access-related design features (TWE-6), as well as incorporation of agency BMPs (TRAN-1, TRAN-2, and TRAN-3), would minimize potential impacts. The following discussions characterize transportation and access conditions at each terminal location.

<u>Northern Terminal</u>

The Northern Terminal is located about 2 miles from an east/west Union Pacific railroad line that generally follows I-80 and State Route 76. Access to the Northern Terminal site and the transmission line alignments leading to and from the terminal site is available via existing I-80 interchanges and State Highway 76 intersections. A road network connected to these interchanges and intersections exists, but it is incomplete in terms of access to the terminal site. The road network is composed of public and private gravel roads. Access to the transmission line alignment and terminal site could be achieved with extensions to the existing roadway network. The use of existing private roadways would be advantageous and any necessary new roads would be designed and specified for the Agency Preferred Alternative in the Road Access Plans (TWE-6) and Access Road Site and Management

Plans (TRAN-1). Additional road maintenance would be expected from new road construction and from use of local roadways and would be implemented as specified in the Road Access Plans (TWE 6) and Access Road Site and Management Plans (TRAN-1). New connections to the I-80, State Route 76, and railroad crossings appear to be unnecessary or avoidable. The nearest airport to the northern site, Rawlins Municipal Airport, is about 5 miles away. Any potential impacts of terminal construction on air traffic would be minimized by adherence to applicant design features (TWE-55) and agency BMPs (GEN-9, AC-1, AC-4, and PHS-3).

Summary: After considering design features, agency BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. No substantial safety impacts would be expected. Access impacts would be temporary and minor. No impacts on airports or airspace operations are anticipated based on facility features and the distance to the nearest airport operations.

Southern Terminal

The Southern Terminal is located in an area currently served by U.S. Highway 95. Access to the southern terminal site, or alternative terminal site, and the transmission line alignments leading to and from the terminal site is available via one primary intersection. A road network is connected to this intersection, but it is incomplete in terms of access to the terminal site. The road network is composed of public and private paved and gravel roads. Access to the transmission line alignment and terminal site could be achieved with extensions to the existing roadway network. The use of existing private roadways would be advantageous and any necessary new roads would be designed and specified for the Agency Preferred Alternative in the Road Access Plans (TWE-6) and Access Road Site and Management Plans (TRAN-1). Additional road maintenance would be expected from new road construction and from use of local roadways and would be implemented as specified in the Road Access Plans (TWE 6) and Access Road Site and Management Plans (TRAN-1). No railroads are located in the vicinity. The nearest airport to the southern site, Boulder City Municipal, is 12 miles away.

With Design Option 2, the southern converter station would be located at IPP and there would be a series compensation station between IPP and Las Vegas. This would change construction requirements, but the transportation and access impacts from the Southern Terminal with Design Option 2 would be similar to those described for the alternatives. Design Option 2 would shift the location of trip generation from various facilities associated with the alternatives to new locations. This shift is not expected to create substantive effects that were not described for the alternatives. No substantial differences in transportation and access effects would be expected during the operation and decommissioning phases of the Project.

With Design Option 3, an additional substation would be built near IPP. No substantive transportation and access impacts would be anticipated from this substation site.

Summary: After considering design features, agency BMPs and other project approval requirements listed above and under the Northern Terminal, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. No substantial safety impacts would be expected. Access impacts would be temporary and minor. No impacts on airports or airspace operations are anticipated based on facility features and the distance to the nearest airport operations.

As part of the Construction, Operations and Maintenance (COM) Plan, an Access Road Plan would be developed for the Northern and Southern terminals during final engineering and design to define site-specific access to each structure and temporary work area. The plans would incorporate relevant local, state, and federal agency standards regarding road design, construction, maintenance, and decommissioning. The Road Access Plan would incorporate best management practices and specific

approval conditions stipulated by the agencies in their respective decision documents and permits and a variety of design commitments to avoid and minimize impacts. Specific approval conditions would vary and would likely address local road surface and use conditions.

The construction activities, workforce and equipment requirements for the 20-mile transmission line construction units would be very similar or the same for the design options as described for the alternatives.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Market Place Hub

Design Option 2 primarily involves modified transmission line facilities, the southern converter station would be located at IPP and there would be a series compensation station between IPP and Las Vegas. This would change construction requirements, but the transportation and access impacts from Design Option 2 would be similar to those described for the alternatives. Design Option 2 would shift the location of trip generation from various facilities associated with the alternatives to new locations. This shift is not expected to create substantive impacts that were not described for the alternatives. No substantial differences in transportation and access impacts would be expected during the operation and decommissioning phases of the Project.

Design Option 3 – Phased Build Out

Design Option 3 is similar to the alternatives, except the Project would be built and operated in phases, with more components located at the IPP station. Consequently, this option primarily changes the construction schedule to allow a phased build out. The previously described transportation and access impacts would occur over a more extended period of time. The transportation and access impacts from Design Option 3 would be similar to those described for the Alternatives but the impacts would be distributed over the phased construction sequence. Design Option 3 would shift the location of trip generation from various facilities associated with the alternatives to new locations. This shift is not expected to create substantive impacts that were not described for the alternatives. No new transportation and access impacts would be created by extended and phased construction periods. No substantial differences in transportation and access impacts would be expected during the operation and decommissioning phases of the Project.

3.16.6.2 Impacts Common to all Alternative Routes and Associated Components

The following discussions provide an overview of important potential transportation and access impacts that could be caused by the transmission line alternatives. Sections 3.16.6.3 through 3.16.6.6 provide comparative analyses for the impacts within Regions I through IV.

Construction Impacts

Road Construction: Enhancements to the Local Roadway Network

Road extensions, widening and other improvements would increase the size and improve the quality of the local roadway network. These impacts on the local roadway network are characterized by total roadway miles by Alternative. Road Access Plans (TWE-6) and Access Road Site and Management Plans (TRAN-1) would be developed for the Agency Preferred Alternative during final engineering and design. The Road Access Plans would define site-specific access to each structure and temporary work area and which road improvements would be permanent versus temporary. For the purpose of the Draft EIS, access road miles and disturbances are estimated for access roads within the corridor as described in Chapter 2.0 and **Appendix D**. Roadless area construction methods are described in **Appendix B**, Section 3.5.7.3, Roadless Construction Methods.

The COM Plan would incorporate environmental measures, stipulated in the lead agencies' RODs; provide information on the TWE Project design, construction, operation, and maintenance practices; and specify the environmental mitigation measures to be used and implemented by contractors and

personnel. The TWE Project would be planned, constructed, operated, and decommissioned in accordance with the agencies' RODs, the BLM's ROW Grant stipulations, USFS Special Use Permit stipulations, and requirements of other permitting agencies. The COM Plan would include a mitigation monitoring plan to address how each mitigation measure, required by permitting agencies in their respective decision documents and permits, would be monitored for compliance.

The COM Plan would include a specific Road Access Plan that incorporates relevant agency standards regarding road design, construction, maintenance, and decommissioning. The Road Access Plan would incorporate best management practices, stipulated by the agencies in their respective decision documents and permits.

Construction of new access roads would be required only as necessary to access structure sites lacking direct access from existing roads, or where topographic conditions (e.g., steep terrain, rocky outcrops, and drainages) prohibit safe overland access to the site on unpaved roads. Where terrain and soil conditions are suitable, non-graded overland access ("drive & crush") would be utilized. New access roads would be located within the 250-foot-wide transmission line ROW whenever practical and would be sited to minimize potential environmental impacts.

Site-specific improvement requirements would be specified, approved, and implemented. Roads damaged by construction vehicles would be returned to pre-construction condition, as specified by applicable agencies.

With respect to the potential environmental impacts that would be caused by road construction, the existing design features (proponent commitments) include a wide range of measures developed to avoid or decrease environmental impacts from road construction and use. Details are provided in **Appendix C**.

Summary: Impacts to the local roadway network would occur from new road construction and roadway improvements.

Road Safety

Road construction and installation of transmission lines would add vehicle travel to the roadway network and could introduce travel obstructions on local roads creating potential safety issues. No hazardous or unsafe conditions would be expected for motorists and pedestrians given compliance with design features (TWE-5, TWE-6, TWE-9, and TWE-12), agency BMPs (TRAN-1, TRAN-2, TRAN-3, and PHS-3), applicable design and operational standards, regulations, laws and permit requirements.

Construction involving narrow roads with horizontal and vertical curves and the presence of large, slow moving trucks also creates potential safety issues, especially where construction vehicles travel along routes used by others. Even though access roads serving the 250-foot-wide transmission line ROW would be designed to meet road safety standards, travel on them is likely to generate safety issues because sharp horizontal and vertical curves limit sight distance and generate the potential for excessive speeds and longer stopping distances on steep segments. The potential for safety issues is higher for large trucks, trucks with heavy loads and trucks being driven by drivers who may be unfamiliar with road conditions. Adherence to design features (TWE-5, TWE-6, TWE-9, and TWE-12) and agency BMPs (TRAN-1, TRAN-2, TRAN-3, and PHS-3) would minimize any potential safety issues.

Summary: After considering design features, BMPs, and other project approval requirements, the following conclusion can be made. Minor and temporary safety issues would be created, but no hazardous or unsafe conditions would be created.

Road Maintenance and Load Limits

Construction activity would have impacts on upgraded roads, but increased traffic and travel on these roads by heavy vehicles would contribute to local roadway degradation resulting in the need for additional road maintenance. The weight of heavy equipment and transmission structures being transported to and from construction areas may exceed the load limits specified for some roads in the analysis area. TWE would have to obtain permits from state, county, and local roadway authorities to transport heavy equipment and transmission structures. Road maintenance agreements with the applicable roadway authorities also may be required. The agreements would address the potential for:

- Road damage and corresponding liability for damage and repairs;
- Compliance failures following completion of the Road Access Plans and local permitting processes; and
- Compliance monitoring, including the need for third party monitors paid for by the Project proponent, with the third party reporting to BLM and other agencies.

Maintenance requirements for new steep and mountainous access roadways would be higher due to the higher potential for erosion and road damage during wet or icy conditions. These conditions could lead to rockfall and rutting of the travel surface. Road repair also would be more difficult and costly under these conditions, compared to routine repair on rolling and flat roads. Implementation of design features (TWE-5, TWE-6) and agency BMPs (TRAN-1 and TRAN-2) would address the need for and assure completion of required road maintenance.

Summary: After considering design features, agency BMPs, and other project approval requirements, overall impacts on road maintenance would be minor in flat and rolling terrain and moderate in steep and mountainous terrain.

Capacity and Congestion

Project construction would create minor and incidental increases in local traffic, but is not expected to create substantial congestion for extended periods. Anticipated traffic would not exceed level of service standards established by the local governments or state transportation agencies. This occurs primarily because of high existing levels of service on the local roadway network (low volumes relative to available capacity) and the relatively broad distribution of construction traffic throughout the day and within the roadway network.

Incidental congestion and delay would be expected from the following:

- Slow moving trucks and construction vehicles;
- Vehicle turning movements where construction occurs near and parallel to roadways; and
- Travel delays and detours associated with transmission line installation in some locations.

Temporary travel delays involving major roads (Interstate Highways, U.S. highways, and state highways) and railroads may occur for line installation at crossings. Shorter duration delays or no delays are anticipated where lines cross narrower roads with lower traffic volumes.

Design features (TWE-5 and TWE-6), as well as the following construction processes are included in the Project POD to address impacts from lines crossing roads and railroads during construction.

- For protection of the public during wire installation, guard structures would be erected over highways, railroads, power lines, structures, and other barriers. Guard structures would consist of H-frame wood poles placed on either side of the barriers or by using boom trucks

raising a guard cross beam. These structures would prevent ground wires, conductors, or equipment from falling across obstacles.

- Equipment for erecting guard structures would include augers, backhoes, line trucks, boom trucks, pole trailers, and cranes. Guard structures may not be required for small roads. In such cases, other safety measures such as barriers, flagmen, or other traffic controls would be used. Following stringing and tensioning of all ground wires and conductors, the guard structures would be removed and the area restored. Pilot lines would be pulled (strung) from tower to tower by either a helicopter or land operated equipment, and threaded through.
- The proposed line crossings would be coordinated with the appropriate entity and TWE would obtain all required licenses, permits, or agreements.

Agencies providing approvals for road construction would define best management practices and adherence to agency BMPs (PHS-5, PHS-6, TRAN-2, and TRAN-3), ensure traveler safety, provide for emergency response vehicle access through construction areas, and minimize delays.

The following discussion provides additional detail to clarify the extent and magnitude of potential delays and related measures to minimize safety risks and travel delays for motorists.

Interruption of road traffic is not anticipated during conductor stringing and tensioning activities unless required under the terms and conditions of a specific road or highway crossing permit. As described in Section 3.5.2.5 of the PDTR (**Appendix D**), pilot lines would be pulled from tower to tower by either a helicopter (most commonly) or land operated equipment. The use of a helicopter to pull the pilot lines is commonly used so that impacts to road traffic are minimized or avoided. For safety and efficiency reasons, conductor stringing and tensioning activities are typically performed during daylight hours and are scheduled to coincide to the extent practical with periods of least road traffic in order to minimize traffic disruptions.

For public protection during stringing activities, temporary guard structures would be erected at road crossing locations, where necessary. As described in the PDTR, these temporary guard structures would be placed on either side of the road to prevent shield wire, conductors, or equipment from falling on underlying facilities and disrupting traffic. Typically, guard structures are installed just outside of the road ROW. Although the preference is for access to each of these guard structure locations to be located outside of the road ROW, it may be necessary for the access to be within the road ROW depending upon topography and access restrictions imposed by the regulatory agencies (i.e., State DOTs, county road and bridge departments, etc.). Access use within road ROWs would be performed in compliance with the stipulations of road crossing permits and regulatory agency requirements.

Site-specific road crossing locations with excessive widths (generally greater than 200 to 300 feet), such as those at interstate highways, would require installation of temporary guard structures in medians between opposite traffic flow lanes. Although TWE does not currently anticipate needing guard structures in medians, as final engineering design progresses, locations requiring center median guard structures may be identified. The erection and dismantling of these temporary guard structures may require traffic diversions. These traffic diversions, which may last from a few hours to a day, involve closure of the shoulder of the road or, in more congested locations, might consist of the closure of one lane of traffic. Complete closure of one direction of traffic is not anticipated. Temporary traffic diversion signs, signals, markers, barriers and traffic control personnel, if required by the state DOT, would be employed. These activities would be coordinated with the appropriate state DOTs. Traffic disruptions would be kept to a minimum and TWE would comply with crossing permit requirements, which typically limit durations of traffic interruptions.

In urban locations or for extremely high volume roadways (such as interstate highways), the state DOTs may require the installation of protective steel netting above the roadway for the duration of conductor stringing and tensioning operations (generally a few days to 2 to 3 weeks). The installation

of this protective steel netting requires a brief closure of the roadway (generally a few minutes to 15 to 20 minutes) while the netting is pulled across the roadway and hoisted onto the temporary support structures. This process is repeated when the netting is removed. Because of the heavy traffic volume and the impact of stopping traffic, these nettings are typically installed during the lowest traffic period (normally 3am to 5am on a Sunday morning) per the requirements of the state DOTs. Although not anticipated, any traffic stoppage would employ all appropriate state DOT traffic safety requirements (signage, flagmen, lighting, signals, temporary barriers, law enforcement, etc.).

The delivery of large pieces of equipment or material as part of the construction process may slow or interrupt traffic on state or county roads on an intermittent basis. The durations of these types of traffic disruptions are typically very short, a few minutes or less, while the delivery truck passes down a roadway or turns a corner. The limited number of large pieces of equipment or materials that are delivered to any one portion of the Project tends to make traffic disruptions infrequent and generally unnoticeable by the motoring public.

Summary: After considering design features, agency BMPs, and other project approval requirements, the following conclusion can be made. The Project may create minor delays during installation of lines over major roadways. Incidental travel time delays are not expected to influence emergency response times substantially and would not substantially inconvenience travelers using the roadway network.

Road Access

Road construction may require incidental road closures and/or detours that temporarily create access difficulties and/or restrictions that limit access to public and private property, but adherence to design features (TWE-6) and agency BMPs (TRAN-1, TRAN-2, and TRAN-3) would help to limit and plan for the closures. Access restrictions such as those associated with roadless areas and areas with seasonal access limits are addressed in Section 3.13, Recreation Resources, and Section 3.14, Land Use.

Increased access and improved travel conditions would result from roadway network improvements as construction proceeds. This would incrementally improve emergency response times and provide access to previously inaccessible areas; however, increased access would enhance the potential for unauthorized road and trail network expansions (Section 3.13, Recreation Resources, and Section 3.14, Land Use). Increased access could lead to unplanned and prohibited access. These issues are addressed as a potential recreation impact in Section 3.13, Recreation Resources.

Summary: After considering design features, agency BMPs, and other project approval requirements, the Project would create minor access difficulties and/or restrictions that may temporarily limit access to public and private property.

Railroad Crossings

Road and transmission line construction involving railroad crossings is common. The use of existing at grade road/railroad crossings and adding new railroad/transmission line crossings create potential safety issues. As a result, a wide range of procedures and construction practices aimed at minimizing construction and post-construction impacts on motorists, railroad operations, and transmission line operations have been developed and are implemented as Project requirements. These measures focus on safety and specify design standards that must be met before construction begins. They also include construction period protocol and post-construction practices to follow to avoid vehicle, railroad, and transmission line conflicts.

Railroad crossing operations and procedures are controlled by and permitted through the railroad company operating the rail line. Terms and conditions to be followed are specified in the crossing permit. Typically, stoppage of railroad traffic is not required during construction or conductor stringing and tensioning activities. Crossing activities are similar to those for road crossings as described in the

PDTR and typically involve the use of guard structures. Stringing and tensioning activities would be performed in coordination with the appropriate railroad authorities. For safety and efficiency, stringing and tensioning activities are performed during daylight periods and scheduled to coincide with times of least railroad traffic. The railroad would typically provide a switchman who is present at all times when work is being performed near or over any railroad line.

Summary: The Project may create minor railroad operation and safety issues during installation of lines over railroad tracks, but implementation of the design features and agency BMPs discussed above under "*Capacity and Congestion*" would help to minimize those issues.

Airport and Airspace Proximity

Transmission line towers and lines are a navigation issue and become a hazard if they are located too close to airport operations or military airspace operating areas. Transmission line construction in the vicinity of an airport presents the potential for new flight safety issues. The key determinant for an effect is proximity between flight paths and transmission line locations and heights (see Section 3.16.4.4, Military Airspace Operating Areas) and compliance with applicable requirements. The TWE Project would be designed to comply with FAA regulations, including lighting regulations, to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips. In addition, coordination with military areas is required to avoid conflicts.

Summary: The Project may create operation and safety issues near airports and may create unresolved conflicts in military airspace operating areas, but incorporation of TWE design features (TWE-55) and implementation of agency BMPs (GEN-9, AC-1, AC-4, and PHS-3) are expected to lessen the extent of the safety issues to permissible levels. If not, it is currently assumed that any routes with irresolvable issues related to airports or airspace would require additional mitigation to be applied, including the possibility of suggested reroutes.

Operational Impacts

Incidental and minor safety impacts could occur in relation to slow moving Project vehicles on steep roads with limited sight distance destined for the transmission lines and related facilities, but the travel volumes would be far lower and more distributed over time than those associated with the construction phase. Impacts on maintenance requirements would be negligible. These impacts would be associated with normal travel to and from the transmission lines for inspections and repairs.

Based on the number of trips generated during the operational period and their distribution within the roadway network, substantial capacity and congestion impacts are not anticipated. Incidental congestion and delay would be expected from the following:

- Slow moving trucks and service vehicles; and
- Vehicle turning movements where activities occur near and parallel to roadways.

Incidental travel time delays are not expected to substantially influence emergency response times or local travel.

Access roads not required for facility operation and maintenance would be closed or closed and reclaimed/restored. Permanent roads built for the Project on NFS lands and BLM administered lands also would be closed to the public if determined necessary by the local land management agency. Signs would indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. These signs would be maintained and replaced as part of the routine maintenance. The proponent would monitor permanent roads on NFS land and BLM-administered lands yearly, and the applicable land-managing agency would be provided with annual

monitoring reports. Roads would be maintained as required by applicable Special Use Permits or BLM ROW grants.

Railroad impacts would involve infrequent crossings by construction vehicles and occasional inspections and repairs in the vicinity of railroad tracks. Impacts to railroad operations could occur if a repair is needed over an active track, but this would be rare.

Impacts on airports would not change during the operational phase.

Summary: Operational phase transportation and access impacts would be similar to construction phase impacts, but the magnitude of those impacts would be less and minor.

Decommissioning Impacts

Impacts during decommissioning would be similar to those anticipated during construction. Implementation of agency BMP MIT-3, which requires that all control and mitigation measures established for the Project in the POD and other required plans must be incorporated into a decommissioning plan that would be approved by the federal land managers, would assure minimization of impacts. For access roads serving the transmission line, the Applicant is responsible for the decommissioning and reclamation of access roads following abandonment in accordance with the landowner's or land agency's direction. Roadway reclamation would reduce motor vehicle access and return the transportation network back to pre-construction conditions. Temporary access roads may be left intact through mutual agreement of the appropriate local, state and federal road and land management agencies, landowners, the tenants, and Project proponents. Removal of transmission line towers and lines would eliminate navigation hazards.

Summary: After considering design features, agency BMPs, and other project approval requirements, decommissioning impacts would be similar to those identified for the construction phase, above. Some impacts would occur after removal of the transmission lines.

3.16.6.3 Region I

Table 3.16-4 provides a tabulation of impacts associated with the alternative routes in Region I.

Table 3.16-4 Summary of Region I Alternative Route Impact Parameters

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
New Permanent Access Roads: Miles (Flat)	67	102	79	136
New Permanent Access Roads: Miles (Rolling)	94	82	123	65
New Permanent Access Roads: Miles (Steep)	63	39	67	41
New Permanent Access Roads: Miles (Mountainous)	3	0	0	0
Total Miles of New Permanent Access Roads	227	223	269	242
Interstate Highway Crossings	0	0	0	0
U.S. Highway Crossings	1 – U.S. 40	1 – U.S. 40	1 – U.S. 40	1 – U.S. 40
State Highway Crossings	3 - 71, 318, 789	3 - 71, 789, 318	4 - 13 (x2), 70, 71	3 - 71, 318, 789
Railroad Crossings	0	0	3	0
Center Line Passing Through Public Land (miles)	117	118	100	133
Center Line Passing Through Private Land (miles)	38	41	86	39

Table 3.16-4 Summary of Region I Alternative Route Impact Parameters

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of Airports within 5 Miles	2 Rawlins Muni / Harvey Field Memorial Hospital (H)	2 Rawlins Muni / Harvey Field Memorial Hospital (H)	6 Rawlins Muni / Harvey Field Memorial Hospital (H) Craig Moffat Craig (H) Mesa View Ranch Dixon	2 Rawlins Muni / Harvey Field Memorial Hospital (H)
MOAs within 20 Miles	0	0	0	0
MOAs with 250-Foot-Wide Transmission Line ROW Overlap	0	0	0	0

(H) Heliport

Alternative I-A (Applicant Proposed)

Key Parameters Summary

Alternative I-A would require construction of 227 miles of new roadway including 66 miles in steep and mountainous terrain. Four major roads would be crossed. No railroads would be crossed. The centerline would pass through 117 miles of public land and 38 miles of private land. Two airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative I-B

Key Parameters Summary

Alternatives I-B would require construction of 223 miles of new roadway including 39 miles in steep terrain. Four major roads would be crossed. No railroads would be crossed. The centerline would pass through 118 miles of public land and 41 miles of private land. Two airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative I-C

Key Parameters Summary

Alternatives I-C would require construction of 269 miles of new roadway including 67 miles in steep terrain. Five major road crossings and three railroad crossings are required. The centerline would pass through 100 miles of public land and 86 miles of private land. Six small airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on MOAs would occur.

Alternative I-D (Agency Preferred)

Key Parameters Summary

Alternatives I-D would require construction of 242 miles of new roadway including 41 miles in steep terrain. Four major road crossings and no railroad crossings are required. The centerline would pass through 133 miles of public land and 39 miles of private land. Two small airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on MOAs would occur.

Tuttle Easement micro-siting options 2 and 3 would add highway crossings which are not included in Option 1. Option 2 would add 2 additional highway crossings. Option 3 would add 1 crossing. Overall, there are no substantive transportation or access advantages to any of the options within Tuttle Easement micro-siting when compared to Alternative I-D.

Alternative Connectors in Region I

The Mexican Flats Alternative Connector would add 13 flat miles to the roadway network on only public land and would cross SH 789.

The Baggs Alternative Connector would add 31 rolling miles to the road network on primarily public land and would cross SH 789. A connector at this point would provide no transportation and access advantages.

The Fivemile Point North Connector would add 4 flat miles to the roadway network on primarily public land and would cross SH 789.

The Fivemile Point South Connector would add 3 flat miles to the roadway network on primarily public land and would cross SH 789.

There are no distinct transportation advantages or disadvantages to the alternatives achieved through the use of any alternate connector.

Alternative Ground Electrode Systems in Region I

It would be necessary to locate the northern ground electrode system within 100 miles of the Northern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. **Table 3.16-5** provides a comparison of alternative electrode bed locations proposed near the northern terminal.

Table 3.16-5 Summary of Region I Alternative Ground Electrode System Location Impacts for Transportation and Access

Alternative Ground Electrode System Locations	Analysis and Conclusions
Separation Flat – All Alternative Routes	Approximately 13 miles from the 250-foot-wide transmission line ROW (all alternative routes), requires 17 miles of access road construction, low voltage line crosses I-80 and the railroad, expands road network, creates moderate safety and maintenance effects.

Table 3.16-5 Summary of Region I Alternative Ground Electrode System Location Impacts for Transportation and Access

Alternative Ground Electrode System Locations	Analysis and Conclusions
Separation Creek – All Alternative Routes	Partially located within the 250-foot-wide transmission line ROW, may require up to 20 miles of access road construction, has proximity to I-80, expands road network, creates moderate safety and maintenance effects.
Eight Mile Basin – All Alternative Routes	Approximately 4 miles from Alternative I-A may require up to 6 miles of access road construction, located directly off State Highway 71, creates minor safety and maintenance effects.
Shell Creek (Alternatives I-A and I-D)	Approximately 33 miles from the Alternative I-A, requires 43 miles of access road construction, requires extensive travel on unimproved roads, expands the road network the most, creates the most safety and maintenance effects.
Little Snake East (Alternatives I-A, I-B, and I-D)	Approximately 9 miles from Alternative I-A, requires 12 miles of access road construction, involves travel on existing county roads, alternative access routes available, minor safety and maintenance effects (**Best for I-A**).
Little Snake West (Alternative I-A)	Approximately 10 miles from Alternative I-A, requires 14 miles of access road construction, involves travel on existing county roads, alternative access routes available, minor safety and maintenance effects.
Shell Creek (Alternative I-B)	Approximately 26 miles from the Alternative I-B, requires 34 miles of access road construction, requires extensive travel on unimproved roads, expands the road network the most, and creates the most safety and maintenance effects.
Little Snake West (Alternatives I-B and I-D)	Approximately 5 miles from Alternative I-B, requires 7 miles of access road construction, involves travel on existing county roads, alternative access routes available, minor safety and maintenance effects (**Best for I-B**).

Region I Conclusion

Based on the information shown in **Table 3.16-4**, Alternatives I-C and I-D provide the most enhancements to the roadway network. Alternatives I-B and I-D provides the least impact from new/improved steep and mountainous roads. All other parameters are virtually equal across all alternatives.

3.16.6.4 Region II

Table 3.16-6 provides a tabulation of impacts associated with the alternative routes in Region II.

Table 3.16-6 Transportation and Access Evaluation Factors for the Alternatives in Region II

Evaluation Factors	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
New Permanent Access Roads: Miles (Flat)	89	142	206	57	96	62
New Permanent Access Roads: Miles (Rolling)	136	168	159	147	126	128
New Permanent Access Roads: Miles (Steep)	33	98	122	83	67	39
New Permanent Access Roads: Miles (Mountainous)	206	172	70	188	183	297

Table 3.16-6 Transportation and Access Evaluation Factors for the Alternatives in Region II

Evaluation Factors	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Total Miles of New Permanent Access Roads	463	580	556	474	471	526
Number of Interstate Highway Crossings	1 - I-15	5 - I-15, 70 (x4)	9 - I-15, 70 (x8)	1 - I-15	1 - I-15	1 - I-15
Number of U.S. Highway Crossings	5 – 6 (x2), 40 (x2), 89	2 – 6, 89	4 - 6, 50 (x2), 89	3 – 6 (x2), 89	6 – 6 (x2), 40 (x2), 89, 191	8- 6 (x6), 89, 191
Number of State Highway Crossings	15 – 35, 41, 45, 64, 87 (x3), 88, 91, 132 (x4), 174, 208	9 – 10, 28, 31, 64, 122, 125, 132, 139, 174	6 – 10, 64, 100, 125, 139, 322	12 – 28, 31 (x4), 45, 64, 132 (x2), 174, 264 (x2)	10 – 28, 45, 64, 87 (x2), 88, 96, 132 (x2), 174	7- 64, 45, 96,132, 28, 125,174
Number of Railroad Crossings	4	21	10	8	8	11
Center Line Passing Through Public Land (miles)	153	269	287	190	160	188
Center Line Passing Through Private Land (miles)	104	76	77	72	107	79
Number of Airports within 5 miles	6 Pelican Lake Roosevelt Muni Duchesne Muni Thunder Ridge Duchesne County Hospital (H) Nephi Muni	9 Green River Muni Westwater Baxter Pass (H) Rangely District Hospital (H) Rangely Huntington Muni Mount Pleasant Nephi Muni	7 Green River Muni Westwater Baxter Pass (H) Rangely District Hospital (H) Rangely Delta Muni	2 Bonanza Power Plant Nephi Muni	3 Pelican Lake Roosevelt Muni Nephi Muni	3 Bonanza Nephi Muni Desert Aviation
MOAs within 20 Miles	1 – Hill AFB Sevier	2 – Hill AFB Sevier Utah Launch Complex	2 – Hill AFB Sevier Utah Launch Complex	1 – Hill AFB Sevier	1 – Hill AFB Sevier	1 – Hill AFB Sevier
MOAs with 250-Foot-Wide Transmission ROW Overlap	1 – Hill AFB Sevier	2 - Utah Launch Complex Hill AFB Sevier	2 - Utah Launch Complex Hill AFB Sevier	1 - Hill AFB Sevier	1 – Hill AFB Sevier	1 – Hill AFB Sevier

(H) Heliport

Alternative II-A (Applicant Proposed)

Key Parameters Summary

Alternative II-A would require construction of 463 miles of new roadway including 239 miles in steep and mountainous terrain. A total of 21 major road crossings and 4 railroad crossings are required. The centerline would pass through 153 miles of public land and 104 miles of private land. Six airports are located within 5 miles. Alternative II-A enters into the Hill AFB Sevier B&D MOA for 3.4 miles where there is no existing transmission line within a WWEC designated corridor. Alternative II-A contains the Cedar Knoll and Strawberry IRA micro-siting adjustments, all within the transmission line corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on the Utah Launch Complex/White Sands Missile Range would be anticipated. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial. Micro-siting adjustments provide no transportation and access benefits.

There are no substantive transportation or access advantages to any of the options within Strawberry IRA micro-siting when compared to Alternative II-A.

Alternative II-B

Key Parameters Summary

Alternative II-B would require construction of 580 miles of new roadway including 270 miles in steep and mountainous terrain. A total of 16 major road crossings and 21 railroad crossings are required. The centerline would pass through 269 miles of public land and 76 miles of private land. Nine airports are located within 5 miles. Alternative II-B passes through the former Utah Launch Complex/White Sands Missile Range MOA co-located with an existing transmission line within RMP and WWEC designated corridors. Alternative II-B enters into the Hill AFB Sevier B&D MOA for 1 mile co-located with an existing transmission line within a RMP designated corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial.

No military airspace impacts on the Hill AFB Sevier MOA would be expected. Direct conflicts with possible future military airspace operations and/or other operations involving the Utah Launch Complex/White Sands Missile Range could occur even though Alternative II-B is located within existing utility corridors where it passes through this facility.

Alternative II-C

Key Parameters Summary

Alternative II-C would require construction of 556 miles of new roadway including 192 miles in steep and mountainous terrain. A total of 19 major road crossings and 10 railroad crossings are required. The centerline would pass through 287 miles of public land and 77 miles of private land. Seven airports are located within 5 miles. Alternative II-C passes through the former Utah Launch Complex/White Sands Missile Range co-located with an existing transmission line within RMP and WWEC designated corridors. Alternative II-C enters into the Hill AFB Sevier B&D MOA for 1 mile co-located with an existing transmission line within a RMP designated corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA

reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial.

No military airspace impacts on the Hill AFB Sevier MOA would be expected. Direct conflicts with possible future military airspace operations and/or other operations involving the Utah Launch Complex/White Sands Missile Range could occur even though Alternative II-C is located within existing utility corridors where it passes through this facility.

Alternative II-D

Key Parameters Summary

Alternative II-D would require construction of 474 miles of new roadway including 271 miles in steep and mountainous terrain. A total of 16 major road crossings and 8 railroad crossings are required. The centerline would pass through 190 miles of public land and 72 miles of private land. Two airports are located within 5 miles. Alternative II-D enters into the Hill AFB Sevier B&D MOA for 3 miles where there is no existing transmission line within a WWEC designated corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial.

Alternative II-E

Key Parameters Summary

Alternative II-E would require construction of 471 miles of new roadway including 250 miles in steep and mountainous terrain. A total of 17 major road crossings and eight railroad crossings are required. The centerline would pass through 160 miles of public land and 107 miles of private land. Three airports are located within 5 miles. Alternative II-E enters into the Hill AFB Sevier B&D MOA for 3 miles where there is no existing transmission line within a WWEC designated corridor. Alternative II-E contains the Cedar Knoll micro-siting adjustments, both within transmission line corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial. Micro-siting adjustments provide no transportation and access benefits.

Alternative II-F (Agency Preferred)

Key Parameters Summary

Alternative II-F would require construction of 526 miles of new roadway including 336 miles in steep and mountainous terrain. A total of 16 major road crossings and 11 railroad crossings are required. The centerline would pass through 188 miles of public land and 79 miles of private land. Three airports are located within 5 miles. Alternative II-F passes through the Hill Sevier B&D MOA for 1 mile

co-located with an existing transmission line within a RMP designated corridor. Alternative II-F contains the Cedar Knoll micro-siting adjustments, both within transmission line corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. Micro-siting adjustments provide no transportation and access benefits.

Cedar Knoll IRA micro-siting Option 2 is slightly closer to Highway 89 which would result in less access road mileage needed to reach the site. Overall, there are no substantive transportation or access advantages to any of the options within the Cedar Knoll IRA micro-siting options when compared to Alternative II-F.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation is approximately 3 miles longer than the comparable portion of Alternative II-F, but requires 4 fewer miles of new access roads. The Emma Park Alternative Variation adds 7 additional miles of private land along the transmission line relative to Alternative II-F. This variation has 1 major roadway crossing, which is the same as Alternative II-F. The Emma Park Alternative Variation provides no substantive transportation or access advantages when compared to Alternative II-F.

Alternative Connectors in Region II

The Castle Dale Alternative Connector adds 20 road miles involving a mix of flat miles (10 miles) and mountainous miles (10 miles). The Castle Dale Alternative Connector passes through 7 miles of public land and 4 miles of private land.

The Price Alternative Connector adds 31 mostly steep (21 miles) access road miles and passes through 15 miles of public land and 4 miles of private land. Two railroad crossings are required.

The Lynndyl Alternative Connector adds 34 mostly flat and rolling access road miles and passes through 15 miles of private land and 9 miles of public land. The connector requires one major road crossing and no railroad or airport conflicts. This connection provides a north/south route with no substantive transportation and access advantages.

The IPP East Alternative Connector involves 3 flat access road miles and passes through 3 miles of public land with no road, railroad, or airport conflicts. This connector provides a conflict free north/south route.

The Highway 191 Alternative Connector adds 13 road miles of mountainous roads. The Highway 191 Alternative Connector passes through 3 miles of public land and 2 miles of private land. This connector also has 1 major roadway crossing, Highway 191. Use of this connector provides no substantive transportation or access advantages.

There are no distinct transportation advantages or disadvantages to the alternatives achieved through the use of any alternate connector.

Region II Conclusion

Based on the information shown in **Table 3.16-6**, Alternative II-C provides the most enhancements to the roadway network and the least impact from new/improved steep and mountainous roads. All other parameters are virtually equal across all alternatives.

3.16.6.5 Region III

Table 3.16-7 provides a tabulation of impacts associated with the alternative routes in Region III.

Table 3.16-7 Transportation and Access Evaluation factors for the Alternatives in Region III

Evaluation Factors	Alternative III-A	Alternative III-B	Alternative III-C
New Permanent Access Roads: Miles (Flat)	223	262	279
New Permanent Access Roads: Miles (Rolling)	15	73	56
New Permanent Access Roads: Miles (Steep)	135	39	96
New Permanent Access Roads: Miles (Mountainous)	50	27	3
Total Miles of New Permanent Access Roads	423	401	433
Interstate Highway Crossings	1 – I-15	1 – I-15	1 – I-15
U.S. Highway Crossings	4 – U.S. 6, Old 6/50 (x2), 40	2 – U.S. 6/50, Old 6/50	5 – U.S. 6/50, Old 6/50, U.S. 93 (x3)
State Highway Crossings	7 – 12, 18 (x3), 21, 56, 144	4 – 21, 56, 78, 168	3, 21, 56, 168
Railroad Crossings	4	10	11
Center Line Passing Through Public Land (miles)	239	236	247
Center Line Passing Through Private Land (miles)	37	48	61
Number of Airports within 5 miles	1 Milford Muni / Briscoe Field	2 Milford Muni / Briscoe Field Sun Valley Estates	2 Milford Muni / Briscoe Field Sun Valley Estates
MOAs within 20 Miles	4 Hill AFB Sevier MOA Wendover MOA Nellis Desert MOA Nellis MOA	4 Hill AFB Sevier MOA Wendover MOA Nellis Desert MOA Nellis MOA	5 Hill AFB Sevier MOA Wendover MOA Nellis Desert MOA Nellis MOA
MOAs with 250-Foot-Wide Transmission ROW Overlap	Hill AFB Sevier B MOA (Most Overlap)	Hill AFB Sevier B MOA Nellis Desert MOA (Conflict)	Hill AFB Sevier B MOA Nellis Desert MOA (Most Conflict)

Alternative III-A (Applicant Proposed)

Key Parameters Summary

Alternative III-A would require construction of 423 miles of new roadway including 185 miles in steep and mountainous terrain. A total of 12 major road crossings and 4 railroad crossings are required. The centerline would pass through 239 miles of public land and 37 miles of private land. One airport is located within 5 miles. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur. Alternative III-A passes through the Hill AFB Sevier B MOA within existing utility corridors and is

located within 20 miles of the Nellis AFB Desert MOA boundary. Alternative III-A also is located within close proximity to MTR IR-293 within the Hill AFB Sevier B MOA, crosses MTR VR-209 in Millard County, Utah outside of the Hill AFB Sevier B MOA, and is in close proximity to (parallel) and crosses over MTR VR-209 outside of the Desert MOA in Clark County, Nevada. In each case, existing utility corridors are present.

Alternative III-A passes through the Hill AFB Sevier B MOA and is co-located with an existing transmission line for approximately 8 miles and then not co-located for the remaining 30 miles through the MOA, but generally is within existing RMP and WWEC corridors when not co-located with other transmission lines. Alternative III-A also is located within close proximity to MTR IR-293 within the Hill AFB Sevier B MOA, crosses MTR VR-209 in Millard County, Utah, outside of the Hill AFB Sevier MOA, and is in close proximity to (parallel) and crosses over MTR VR-209 outside of the Desert MOA. The MTR VR-209 crossover is located in Lincoln County, Nevada. Alternative III-A is in close proximity to MTR VR-209 in Washington County, Utah, and in Lincoln and Clark counties, Nevada. In each case, existing utility corridors are present.

The use of existing utility corridors within military MOAs creates minor to severe impacts on military operations and the military's mission (refer to the discussion under Alternative III-B for related details).

Alternative III-B (Agency Preferred)

Key Parameters Summary

Alternative III-B would require construction of 401 miles of new roadway including 66 miles in steep and mountainous terrain. A total of 7 major road crossings and 10 railroad crossings are required. The centerline would pass through 236 miles of public land and 48 miles of private land. Two airports are located within 5 miles. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because the small airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements.

Alternative III-B passes through the Hill AFB Sevier B MOA inside and outside of established utility corridors. Alternative III-B crosses MTR VR-209 in Millard County, Utah, outside of the Hill AFB Sevier B MOA, and is in close proximity to (parallel) and crosses over MTR VR-209 outside of the Desert MOA in Lincoln and Clark counties, Nevada. In each case, existing utility corridors are present.

Alternative III-B passes through the Nellis AFB Desert MOA within and outside of RMP and WWEC corridors. Alternative III-B is not co-located with an existing transmission line or aligned with existing utility corridors for 51.5 miles.

The addition of transmission lines within MOAs where no existing transmission lines are present and no existing utility corridors have been designated creates practical and regulatory conflicts with military air space operations and may require a BLM RMP Amendment depending on the RMP affected. This situation would be addressed on a case-by-case basis, ensuring coordination, as needed, with the military and the State of Utah. Final resolution of this issue is required as Alternative III-B has been selected as the Agency Preferred Alternative.

At the Hill AFB Sevier B MOA, the proposed transmission line structures would exceed the 100-foot vertical height restriction. This and the presence of new transmission lines in corridors without overhead lines would interfere with the military's ability to train pilots at extremely low levels and would impact cruise missile testing. To address this issue, DOD has requested that all stanchions, poles, and other transmission-related infrastructure (regardless of height and location) be lighted, marked, and charted on FAA flight sectionals, maps, and other appropriate navigation reference material to ensure

flight safety and proper VFR/IFR de-confliction on/near the UTTR. The IPP transmission line also exceeds the 100-foot height restriction, but it is not lighted. Adding light to each TWE structure through the Sevier B MOA may cause impacts to the University of Utah's Telescope Array Project, which requires dark night skies.

The presence of transmission line personnel within MOAs at Hill AFB Sevier B MOA may require rescheduling maneuvers. All construction activities in MOAs would require coordination and scheduling with the military to avoid potential conflicts. All transmission line helicopter activity would require flight plan coordination and formal notification. All transmission line personnel planning to enter MOAs would be reported to the military with adequate lead time. The notifications would provide specific locations and timeframes for their activities.

Transmission line equipment that emits radio frequencies may interfere with military communications and operations. As a result, specific radio frequencies emitted by the Project's microwave communication facilities would be selected based on coordination with the military to avoid any conflict with radio communications at Hill AFB Sevier B MOA and the UTTR. The use of transmission line cameras also would require coordination with the military.

At Nellis AFB, the transmission line would impact military operations at Nellis AFB, the NTTR and the Nellis Small Arms Range (SAR)/Jettison Hill boundaries. Measures referenced in the Hill AFB Sevier B MOA discussion also would apply to impacts created within Nellis AFB. However, even after implementation of these measures, various impacts would be expected.

The transmission lines would disrupt military activity and could be damaged by military activity creating financial and system reliability impacts. In addition, transmission line repair and maintenance may be prevented by military operations. The presence of transmission lines also may impact low-level fixed and rotary wing flying operations.

The line would cross the Nellis SAR in the Las Vegas Valley. The presence of a transmission line in this location is incompatible with authorized emergency jettison procedures (Jettison Hill), low-level rotary and fixed wing arrival and departure routes, and live fire operations conducted in the area. Transmission line facilities may be damaged by authorized live fire and/or jettison activities in the area. The proximity of military operations can limit the transmission line operator's ability to respond to contingency problems or emergency situations.

Authorized Low Altitude Tactical Navigation (LATN) airspace and MTRs are located directly above the 250-foot-wide transmission line ROW extending from the Beryl, Utah, area to the northeastern edge of Las Vegas. The segment of transmission line between these two locations would impact low-flying military aircraft and navigation operations. In addition, authorized (LATN) airspace and property used for training is located along the southeastern edge of Las Vegas, in the Gold Butte area. Alternate routes extending along the western edge of Lake Mead would negatively impact helicopter training and LATN capabilities.

The authorized emergency aircraft evacuation/ejection area (i.e., location where pilots exit the aircraft and allow the airplane to fly uncontrolled until the aircraft impacts the ground) is located in the Dry Lake area where the line would be located. Transmission infrastructure built within the emergency aircraft ditch area may be interrupted, severely damaged, or potentially destroyed during an in-flight emergency due to uncontrolled aircraft flight into the structures.

The line would be located within operational areas for A-10 aircraft and helicopters. These areas are used as practice landing areas for training. Apex Hill (just south of U.S. 93) would be an area of concern because it is within an approach and departure zone. These zones are fixed and the east-to-west routes that are not located adjacent to existing transmission lines and may pose a safety hazard for pilots.

The transmission lines may interfere with sensitive flight instruments including navigational aids and aircraft radar. The conditions that exist in and around the test and training range are one-of-a-kind and offer exceptional radar/communication response that cannot be duplicated anywhere else. The applicant would take steps to address this issue. One step includes the use of steel pole, rather than lattice structures.

Uncoordinated construction activity on or near Nellis AFB, Creech AFB and the NTTR, such as usage of cranes and other heavy equipment high enough to penetrate airspace or cause visible distractions like excessive exhaust emissions or dust near airfield operations, is incompatible with military operations. The use of helicopters for the purpose of line construction, maintenance, and inspection on all routes would impact military flying operations on or near Nellis, Creech, and the NTTR to include low-level flight areas, LATN, MTRs, MOAs, and advanced military fixed/rotary wing testing and training missions. Additionally, civilian helicopters used for construction may be impacted by low-level supersonic over flight.

Terminal Instrument Procedures (TERPs) will be impacted at the southern end of Region III where Alternative III-B and III-C intersect and just to the west of this intersection along the Alternative III-C alignment. TERPs address “surfaces” constructed from the electronic signals transmitted by ground and space based air navigation electronic equipment. TERPs are the instrument procedures that aircraft pilots use to fly between airports and land on runways. Each approach and departure is divided into segments as an aircraft proceeds to a safe landing or departure. Each segment is a trapezoid or “trap,” roughly shaped. Within each trap a TERPs expert must ensure an aircraft, at the extreme limits of its authorized altitudes within the trap, has obstacle clearance. The proposed transmission lines and towers conflict with existing departure traps in the two locations. The Air Force will need to review the final transmission line route and TERPs if the line passes through either or both of the two departure trap areas. This review will include final pole locations.

The addition of new transmission line corridors located outside of established corridors conflicts with substantial past and future investments in military facilities by making what is available to the military less usable and less safe.

Alternative III-C

Key Parameters Summary

Alternative III-C would require construction of 433 miles of new roadway including 99 miles in steep and mountainous terrain. A total of 9 major road crossings and 11 railroad crossings are required. The centerline would pass through 247 miles of public land and 61 miles of private land. Two airports are located within 5 miles. After considering design features, BMP and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airport areas would occur because the airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements.

Alternative III-C passes through the Hill AFB Sevier B MOA within established utility corridors. Alternative III-C crosses MTR VR-209 in Millard County, Utah, outside of the Hill AFB Sevier MOA, and crosses MTR VR-209 inside of the Desert MOA in Lincoln County, Nevada. Alternative III-C crosses the Panaca area, where the DOD has no height restrictions for aircraft. In each case, existing utility corridors are present.

Alternative III-C passes through the Nellis AFB Desert MOA within and outside of RMP and WWEC corridors. Alternative III-C is not co-located with an existing transmission line or aligned with existing utility corridors for 69 miles. Alternative III-C passes within 1 mile of the unimproved airstrips used by

the military within the Desert MOA. One airstrip is located in the Delamar dry lake bed. The other is located south of U.S. 93 on the eastern side of Delamar Valley.

The addition of transmission lines within MOAs where no existing transmission lines are present and no existing utility corridors have been designated creates practical and regulatory conflicts with military air space operations and may require a BLM RMP Amendment depending on the RMP affected. This situation would be addressed on a case-by-case basis, ensuring coordination, as needed, with the military and the State of Utah. The discussion under Alternative III-B, above, regarding Hill AFB Sevier B and Nellis AFB Desert MOA also would apply to Alternative III-C. However, the effects on the Desert MOA would be increased by Alternative III-C due to the 17 additional miles of transmission line located outside of existing designated corridors, that military flights are closer to the ground, and the proximity of the Nellis AFB drop zone (10 miles). Transmission line lighting would help mitigate drop zone proximity effects. The addition of new transmission line corridors located outside of established corridors conflicts with substantial past and future investments in military facilities by making what is available to the military less usable and less safe (refer to the discussion under Alternative III-B for related details).

Alternative Variations in Region III

The Ox Valley East and Ox Valley West Variations are slightly less than 2 miles longer than the comparable portion of Alternative III-A. The terrain differences in miles are as follows:

	Flat	Rolling	Steep	Mountainous
Ox Valley East Alternative Variation	0	0	16	19
Ox Valley West Alternative Variation	0	1	15	19
Comparable (Alternative III-A)	1	0	9	23

These terrain differences are minor and would result in few if any real transportation advantages. Both variations primarily pass through public lands with one major roadway crossing.

The Pinto Variation has only 1 mile less road than the comparable portion of Alternative III-A. The terrain differences in miles are as follows:

	Flat	Rolling	Steep	Mountainous
Pinto Alternative Variation	0	27	19	0
Comparable (Alternative III-A)	9	1	14	22

The Pinto Alternative Variation includes slightly more steep terrain and no mountainous terrain. Overall, this difference provides some advantages relative to the comparable portion of Alternative III-A. This variation primarily passes through public lands with one major roadway crossing. One key disadvantage of the Pinto Alternative Variation is that it encroaches into MTR VR-209 (refer to the previous discussion of MOA and MTR conflicts caused by the Alternatives in Region III).

Alternative Connectors in Region III

The Avon Alternative Connector adds 10 flat miles with 5 miles passing through public lands and 3 miles passing through private lands with no major roadway crossings. The Sun Valley Estates airport is located within 5 miles.

The Moapa Alternative Connector adds 17 miles of new primarily flat road with two major road crossings and one railroad crossing, all on public land. One railroad crossing is required.

Alternative Ground Electrode Systems in Region III

It would be necessary to locate the southern ground electrode system within 100 miles of the Southern Terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent.

Table 3.16-8 provides a comparison of alternative electrode bed locations proposed near the Southern Terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Table 3.16-8 Summary of Region III Alternative Ground Electrode System Location Impacts for Transportation and Access

Alternative Ground Electrode System Locations	Analysis and Conclusion
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	Approximately 6 miles from Alternative III-A, requires 7 miles of access road construction, expands road network, and creates minor safety and maintenance impacts.
Halfway Wash-Virgin River (Alternative III-A)	Approximately 4 miles from Alternative III-A, requires 5 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Halfway Wash-East (Alternative III-A)	Approximately 8 miles from Alternative III-A, requires 10 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Mormon Mesa- Carp Elgin Rd (Alternative III-B)	Approximately 8 miles from Alternative III-B, requires 10 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Halfway Wash –Virgin River (Alternative III-B)	Approximately 6 miles from Alternative III-B, requires 7 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Halfway Wash East (Alternative III-B)	Approximately 8 miles from Alternative III-A, requires 10 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Meadow Valley II (Alternative III-C)	Approximately 22 miles from Alternative III-C, access via SH 168, with 29 miles of access road construction to reach the site, minor roadway network expansion and minor increase in safety and maintenance impacts.

Region III Conclusion

Based on the information shown in **Table 3.16-7**, Alternative III-B provides the most enhancements to the roadway network and the least impact from new/improved steep and mountainous roads when compared to Alternative III-A. The main deciding factor between alternatives is their impacts on DOD land. Alternative III-C creates the most conflict. Alternative III-A creates the least conflict.

3.16.6.6 Region IV

Table 3.16-9 provides a comparison of impacts associated with the alternative routes in Region IV.

Table 3.16-9 Transportation and Access Evaluation factors for the Alternatives in Region IV

Evaluation Factors	Alternative IV-A	Alternative IV-B	Alternative IV-C
New Permanent Access Roads: Miles (Flat)	9	15	27
New Permanent Access Roads: Miles (Rolling)	26	19	16
New Permanent Access Roads: Miles (Steep)	11	5	6
New Permanent Access Roads: Miles (Mountainous)	14	32	26
Total Miles of New Permanent Access Roads	60	71	74

Table 3.16-9 Transportation and Access Evaluation factors for the Alternatives in Region IV

Evaluation Factors	Alternative IV-A	Alternative IV-B	Alternative IV-C
Interstate Highway Crossings	0	0	0
U.S. Highway Crossings	2 – 93 (x2)	3 - 93 (x2), 95	2 - 93, 95
State Highway Crossings	3 – 146 (x2), 147	4 – 146, 166 (x2), 167	4 – 146, 166 (x2), 167
Railroad Crossings	2	2	1
Center Line Passing Through Public Land (miles)	31	23	24
Center Line Passing Through Private Land (miles)	6	16	21
Number of Airports within 5 miles	4 St. Rose Dominican Hospital (H) Car Country (H) Boulder City Muni Eldorado Substation (H)	2 Boulder City Muni Car Country (H) Eldorado Substation (H)	2 Eldorado Substation (H) Boulder City Muni
MOAs within 20 Miles	Nellis AFB	Nellis AFB	Nellis AFB
MOAs with 250-Foot-Wide Transmission Line ROW Overlap	0	0	0

(H) Heliport

Alternative IV-A (Applicant Proposed and Agency Preferred)

Key Parameters Summary

Alternative IV-A would require construction of 60 miles of new roadway including 25 miles in steep and mountainous terrain. A total of 5 major road crossings and two railroad crossings are required. The centerline would pass through 31 miles of public land and 6 miles of private land. Four airports are located within 5 miles. The alternative is within 20 miles of Nellis AFB, but is not within 20 miles of the Desert MOA. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports areas would occur because the airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on MOAs would occur.

Alternative IV-B

Key Parameters Summary

Alternative IV-B would require construction of 71 miles of new roadway including 37 miles in steep and mountainous terrain. A total of 7 major road crossings and two railroad crossing are required. The centerline would pass through 23 miles of public land and 16 miles of private land. Two airports are located within 5 miles. The Project is within 20 miles of Nellis AFB, but is not within 20 miles of the Desert MOA. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative IV-C

Key Parameters Summary

Alternative IV-C would require construction of 74 miles of new roadway including 32 miles in steep and mountainous terrain. A total of 6 major road crossings and one railroad crossing are required. The centerline would pass through 24 miles of public land and 21 miles of private land. Two airports are located within 5 miles. The Project is within 20 miles of Nellis AFB, but is not within 20 miles of the Desert MOA. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative Variations in Region IV

The transportation and access characteristics of the Marketplace Variation are virtually identical to the comparable portion of Alternative IV-B except that the Marketplace Variation is about one mile longer and requires more new access road construction. The Eldorado Substation heliport, Boulder City Municipal airport, and the Car Country heliport are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing the variation.

Alternative Connectors in Region IV

The Sunrise Mountain Alternative Connector adds 4 miles of new flat and rolling road on public land with no major road or railroad crossings. There are no apparent unique constraints or opportunities for transportation or access by utilizing this connector.

The Lake Las Vegas Alternative Connector adds 7 miles of new steep road through mostly public land with no major road or railroad crossings. The Car Country heliport is located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this connector

The Three Kids Mine Alternative Connector adds 12 miles of new mostly mountainous road through mostly public land with no major road or railroad crossings. The Car Country and St. Rose Dominican Hospital heliports are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this connector

The River Mountains Alternative Connector adds 19 miles of mountainous roads on public land with no major road or railroad crossings. The Car Country and St. Rose Dominican Hospital heliports are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this more mountainous connector.

The Railroad Pass Alternative Connector adds 6 miles of mostly mountainous roads on private land with one major road crossing and one railroad crossing. The Boulder City Municipal airport and the Car Country heliport are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this more mountainous connector.

Region IV Conclusion

Based on the information shown in **Table 3.16-9**, Alternatives IV-B and IV-C provide the most enhancements to the roadway network while Alternative IV-A provides the least impact from new/improved steep and mountainous roads. All other parameters are virtually equal across all alternatives.

3.16.6.7 Residual Impacts

The following residual transportation and access impacts would be expected after mitigation:

- The local roadway network would be expanded and improved creating increased access, improved travel conditions, improved roadway safety, and reduced short-term maintenance requirements (Beneficial);
- Travel volumes on the local roadway network would increase creating traffic conflicts (Minor Adverse Impact); and
- Alternatives that directly or indirectly conflict with MOAs and/or MTRs would create aviation and military operation conflicts (Substantial Adverse Impact).

3.16.6.8 Impacts to Transportation and Access from the No Action Alternative

The No Action Alternative would not generate the transportation network impacts associated with road improvements and would avoid the construction period incidental transportation impacts described for the Action Alternatives. Minor delays associated with road and transmission line construction would be avoided. Temporary property access disruptions and travel safety issues associated with higher vehicle volumes and heavy, slow moving trucks would be avoided. Road maintenance benefits from improvements and the potential for added road maintenance from the use of local roads by heavy vehicles would not occur. Transmission line railroad crossings and airport navigation hazards from transmission line towers and wires would not be created.

3.16.6.9 Irreversible and Irretrievable Commitment of Resources

The following irreversible and irretrievable commitments of transportation and access resources would be expected from the proposed action and alternatives:

- A portion of the local roadway network capacity would be lost during the construction period. This loss would be irretrievable;
- The use of non-renewable resources and resources that cannot be recycled would occur as a result of roadway construction. This use of these resources would be considered irreversible; and
- Military airspace, military aviation possibilities, and military training operation capabilities would be lost as a result of alternatives that directly or indirectly conflict with MOAs and MTRs. This loss would be substantial and irretrievable during the life of the Project. These impacts would not be irreversible as these capabilities would be available once the transmission line is decommissioned.

3.16.6.10 Relationship Between Local Short-Term Uses and Long-Term Productivity

The proposed action and alternatives would reduce the short-term uses of the local roadway network during construction, but would increase long-term productivity by enhancing connectivity and improving travel conditions.

3.17 Social and Economic Resources

The section describes social and economic conditions and assesses the temporary and long-term effects in the geographic area that could be affected by the Project. The region of study for socioeconomics encompasses 23 counties across 4 states – Wyoming, Colorado, Utah, and Nevada. Information is provided for population and demographics, economic conditions, and social conditions including environmental justice. Socioeconomic conditions and resources addressed include short-term and long-term effects on economic conditions, population, housing, public facilities and services, and tax revenues.

3.17.1 Regulatory Framework

Social and economic conditions are not subject to direct regulation or management, although the NEPA requires they be addressed. Social and economic conditions also are commonly recognized and addressed as a concern in a wide variety of federal, state, and local planning and management processes. Two such planning processes that are particularly relevant to the proposed project are the land use management planning processes conducted by the BLM and the Forest Service for the public lands under their respective management. Guidance regarding consideration of social and economic conditions in those processes is provided by the following:

- BLM, Land Use Planning Handbook, H-1601-1
- U.S. Forest Service, Land Management Handbook, FSH 1909.12

Additional information regarding local land use planning is found in Section 3.14, Land Use.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, published in the Federal Register in 1994, tasks “each Federal agency [to] make achieving environmental justice part of its mission.”

3.17.2 Data Sources

This analysis relies heavily on published information available from federal and state governmental agencies, supplemented by information from academic and private sources. The key data sources include the following:

- Federal agencies: Census Bureau, Bureau of Economic Analysis, Bureau of Labor Statistics, U.S. Department of the Interior and U.S. Department of Agriculture
- State agencies: respective economic, demographic, labor and revenue/taxation departments.

3.17.3 Analysis Area

The geographic extent of the analysis area for social and economic conditions, including environmental justice, is comprised of the 23 counties in which one or more of the alternative routes are located and the communities within those counties that are likely to host non-local construction workers associated with the project. The counties included in the analysis area, and their respective county seats, are listed in **Table 3.17-1**.

Table 3.17-1 Counties and County Seats in the Analysis Area

State	County	County Seat
Wyoming	Carbon	Rawlins
	Sweetwater	Green River
Colorado	Garfield	Glenwood Springs
	Mesa	Grand Junction
	Moffat	Craig
	Rio Blanco	Meeker
	Routt	Steamboat Springs
Utah	Beaver	Beaver
	Carbon	Price
	Duchesne	Duchesne
	Emery	Castle Dale
	Grand	Moab
	Iron	Parowan
	Juab	Nephi
	Millard	Fillmore
	Sanpete	Manti
	Sevier	Richfield
	Uintah	Vernal
	Utah	Provo
	Wasatch	Heber City
	Washington	St. George
Nevada	Clark	Las Vegas
	Lincoln	Pioche

The socioeconomic assessment is focused on the counties in which one or more alternative routes are located based on the following considerations:

- Most of the construction on linear projects in rural areas, such as pipelines, transmission lines, and even highways, is accomplished by a series of construction crews that move along the corridors as the project progresses,
- Many of the direct jobs are filled by workers with specialized skills who relocate temporarily for the express purpose of working on a specific project,
- Few of the non-local workers are accompanied by friends, relatives or other household members, so most of the population influx are workers directly associated with the project
- The non-local workers shift their temporary place of residence (i.e., motels, a private RV, or other accommodations) over time, to reduce commuting time and costs,
- The size of the project-related workforce and availability of temporary housing capacity within the analysis area is such that it is unlikely that many workers would need or choose to commute to communities outside of the affected counties
- With the exception of some basic construction materials, such as sand and gravel, most of the sources of the materials and equipment would be sourced from far outside the region.

The net result of these factors is that the effects on most communities would be of relatively short-duration, typically involve less than the total workforce associated with the project at any one time, have lower secondary employment effects than would be expected for a comparably sized more conventional large-scale construction project at a single location, and result in a relatively low temporary population influx. The effect on local employment and unemployment would be limited in most communities.

3.17.4 Baseline Description

This section uses selected economic and demographic data and narrative to provide a general description of socioeconomic conditions in the analysis area, focusing on conditions potentially affected by construction of the proposed transmission line project.

All 23 counties in the analysis area gained population during the last decade. Between 2000 and 2010, the combined population of the 23 counties increased by 871,054 residents, to 3,158,560; the change represents a net increase of 38.1 percent (**Table 3.17-2**). The largest share of the total growth occurred in the Las Vegas metropolitan area (Clark County, Nevada). Substantial net growth also occurred in the Utah portion of the analysis area between 2000 and 2010. The main drivers of the population growth included retirement migration, natural resource development, and migration associated with other economic development and a broad range of lifestyle factors.

Table 3.17-2 Population in the Social and Economic Analysis Area, 2000 and 2010

State / (Number of counties included)	2000 Population	2010 Population	Population Change, 2000-2010	
			Absolute	Percent
Wyoming (2 counties)	53,252	59,691	6,439	12.1
Colorado (5 counties)	198,825	247,082	48,257	24.3
Utah (14 counties)	655,499	895,173	239,674	36.6
Nevada (2 counties)	1,379,930	1,956,614	576,684	41.8
Analysis Area Total	**2,287,506**	**3,158,560**	**871,054**	**38.1**

Source: U.S. Census Bureau, 2011a.

The analysis area is predominately rural. Seventeen of the counties in the analysis area had fewer than 30,000 residents, with the least populous county having just 4,165 residents in 2010. Four urban counties, containing one or more metropolitan areas, also are included in the analysis area; Grand Junction, Colorado; Provo-Orem and St. George, Utah; and Las Vegas, Nevada; the latter with a 2010 population of more than 1.95 million residents (**Figure 3.17-1**). Population densities ranged from less than 1.0 to 257.8 persons per square mile in 2010, compared to the national average of 87.4 (U.S. Census Bureau 2001b).

There are six Indian Reservations located in the analysis area: the Uintah and Ouray Indian Reservation (Utah), Paiute Indian Reservation (Utah), Moapa Indian Reservation (Nevada), Snow Mountain Indian Reservation (Nevada), Las Vegas Colony (Nevada), and a portion of the Fort Mojave Indian Reservation (Nevada).[1] The largest of these is the Uintah and Ouray Indian Reservation in northeast Utah.

[1] The Snow Mountain Indian Reservation, Las Vegas Colony, and Fort Mojave Indian Reservation are located at considerable distance from any proposed facilities associated with the TWE project.

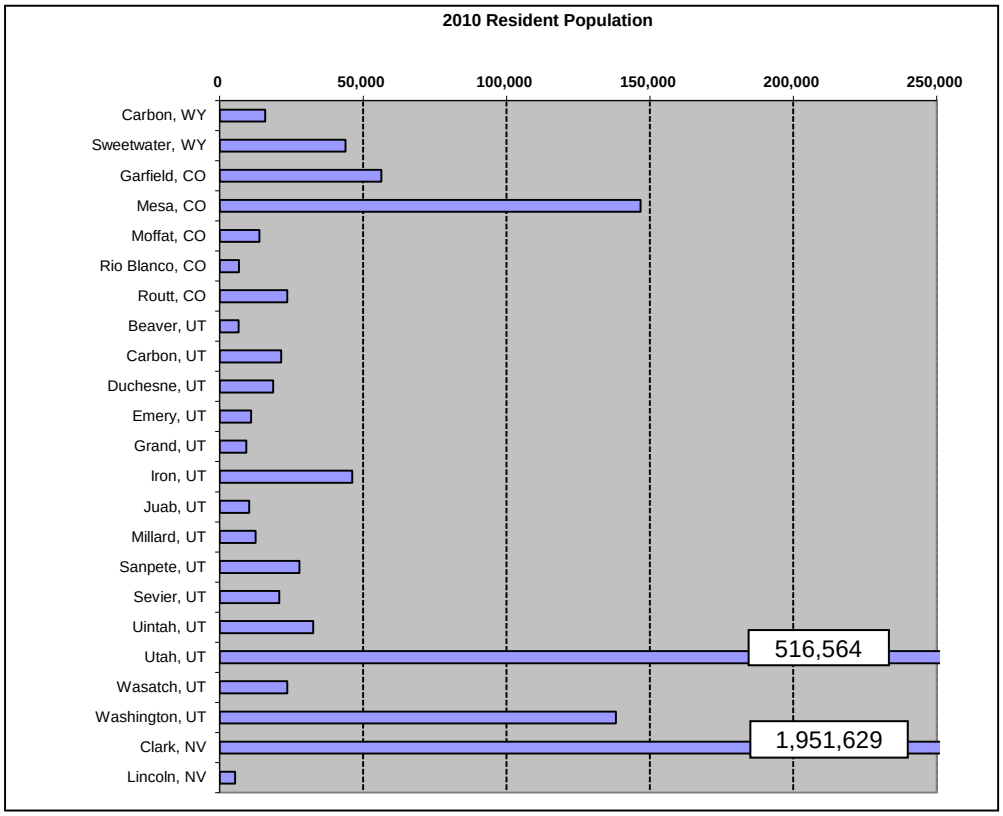


Figure 3.17-1 2010 Population of Counties in the Social and Economic Analysis Area

Prior to the recent national recession, the analysis area had experienced a period of economic growth. Total employment across the analysis area in 2009 was over 1.7 million jobs. That total was nearly 332,000 above the total in 2001, but more than 111,000 fewer jobs than existed at the outset of the national recession. Private sector non-farm jobs accounted for nearly 1.52 million, or 87.6 percent, of the 2009 total. Public sector employment totaled nearly 196,000 jobs, with farm jobs accounting for the remainder. The construction industry, which lost 60,000 jobs between 2007 and 2009, continued to account for more than 127,000 jobs in the analysis area. The accommodations and food industries provided more than 283,000 jobs in 2009, the bulk of which were based in the Las Vegas area (U.S. Bureau of Economic Analysis 2011).

Unemployment rates increased across the analysis area during the national recession that began in late 2007, in some instances dramatically. In 2007, prior to the full weight of the recession becoming apparent, an average of more than 58,000 residents, representing 3.8 percent of the labor force, were unemployed. As the recession continued, average unemployment across the analysis area approached 197,000 in 2010, representing 12.7 percent of the labor force. Average annual unemployment among the counties in the analysis area during 2010 ranged from 5.1 percent to 15.2 percent, with a median rate of 8.8 percent. National unemployment averaged 9.6 percent for the same period (U.S. Bureau of Labor Statistics 2011).

Social conditions and lifestyles in the analysis area vary considerably, reflecting the influences of factors including the economic and geographic setting, the state in which the area is situated, cultural backgrounds, land use and ownership, and climate, among others. Natural resources, the “outdoors,” and public lands, whether in the form of national parks or natural gas resources, play important roles in social conditions and lifestyles across the rural areas. In general, rural residents exhibit a relatively high degree of self-reliance, often looking to local government to focus primarily on the provision of essential public administration,

infrastructure, and services. Over the past 10 to 20 years, economic development and growth have contributed to substantial change in social conditions in much of the rural portions of the analysis area.

Natural resources, the "outdoors," and public lands also influence social conditions in the more urban portions of the analysis area, but the influence is less pronounced. In contrast to the rural areas, growth and development have been a dominant influence shaping social conditions in the metropolitan areas across the analysis area. Immigration of many new residents has been both a cause and an effect associated with the growth.

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, tasks "each Federal agency [to] make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations." Along with most of the country, racial and ethnic diversity has been increasing across the analysis area in recent years. However, with the exception of Clark County, minorities account for smaller shares of the respective county populations in the analysis area than they do at the nation level. Poverty rates across the analysis area also tend to be below the national average, which is reflected in **Table 3.17-3**.

Table 3.17-3 Selected Social Characteristics in the Social and Economic Analysis Area, As Reported in the 2010 Census

	Racial or Ethnic Minority Population		Percent of Total Population in Poverty – 2009	Population Density – Persons/Square Mile (range)
	Number of Resident	Percent of Total Population		
United States	111,927,986	36.3	14.3	87.4
Wyoming (2 counties)	11,576	19.4	7.8	2.2 – 4.2
Colorado (5 counties)	47,876	19.4	10.1	2.1 – 44.1
Utah (14 counties)	133,701	14.9	11.7	1.5 – 257.8
Nevada (2 counties)	1,015,961	51.9	12.4	0.5 – 247.3

Source: U.S. Census Bureau 2011b,c.

As described in Section 2.4.2, the overall analysis area is subdivided into four regions. Selected socioeconomic information and descriptions, with pertinent tallies and sub-totals for each of the four regions, are presented below. **Table 3.17-4** lists the constituent counties associated with each of the four regions. Population change in the analysis area between 2000 and 2010, when examined on a regional basis, ranged from 12.7 percent in Region I to 41.9 percent in Region III. Region I is predominately rural, whereas Region III includes the rapidly growing St. George, Utah, and Clark County, Nevada, urban areas. In absolute terms, the former change equates to a net increase of 10,950 residents, while the latter represents more than 637,000 additional residents. In all regions, the population growth was concentrated in and around the larger communities in each county.

Table 3.17-5 lists the incorporated and unincorporated communities of 2,000 or more residents in each region. These communities tend to be those with the most governmental services, short-term lodging accommodations, and retail trade and service establishments that may be affected by short-term demands. However, not all of those communities would experience short- or long-term growth in association with the project. At the same time, there are many smaller communities within the analysis area, which are not listed in **Table 3.17-5** that may experience some socioeconomic effects associated with the project, primarily

related to hosting temporary workers as the construction moves along the corridor. The table is followed by a brief discussion of key economic and social trends for each region.

Table 3.17-4 Counties in the Social and Economic Analysis Area, by Region[1]

Region I	Region II	Region III	Region IV
Carbon, Wyoming Sweetwater, Wyoming Moffat, Colorado Routt, Colorado	Moffat, Colorado Rio Blanco, Colorado Garfield, Colorado Mesa, Colorado Uintah, Utah Duchesne, Utah Carbon, Utah Emery, Utah Wasatch, Utah Utah, Utah Sanpete, Utah Juab, Utah Millard, Utah Grand, Utah Sevier, Utah	Millard, Utah Beaver, Utah Iron, Utah Washington, Utah Lincoln, Nevada Clark, Nevada	Clark, Nevada

[1] Counties in each region generally are listed from east to west and north to south along the transmission line routing, i.e., from Wyoming to Nevada.

Table 3.17-5 Population in the Social and Economic Analysis Area 2000 and 2010, by Region

Region*	2000 Pop. (Census)	2010 Pop. (Census)	Net Change	Percent Change	Communities with 2,000 or more Residents**
I	86,045	96,995	10,950	12.7	Rawlins, North Rock Springs CDP, Rock Springs, Green River, Craig, and Steamboat Springs.
II	704,577	927,839	223,262	31.7	Carbondale, Glenwood Springs, New Castle, Rifle, Silt, Battlement Mesa CDP, Clifton CDP, Fruitvale CDP, Grand Junction, Fruita, Orchard Mesa CDP, Palisade, Redlands CDP, Maeser CDP, Vernal, Roosevelt, Helper, Price, Huntington, Moab, Heber City, Midway, Park City, Alpine, American Fork, Cedar Hills, Draper, Eagle Mountain, Elk Ridge. Highland, Lehi, Lindon, Mapleton, Orem, Payson, Pleasant Grove, Provo, Salem, Santaquin, Saratoga Springs, Spanish Fork, Springville, Ephraim, Gunnison, Manti, Mount Pleasant, Nephi, Richfield, Salina, Delta, Fillmore.
III	1,522,473	2,160,024	637,551	41.9	Beaver, Cedar City, Enoch, Parowan, Hildale, Hurricane, Ivins, LaVerkin, Saint George, Santa Clara, Washington, Boulder City, Enterprise CDP, Henderson, Las Vegas, Laughlin CDP, Mesquite, Moapa Valley, Nellis AFB CDP, North Las Vegas, Paradise CDP, Sandy Valley CDP, Spring Valley CDP, Summerlin South CDP, Sunrise Manor CDP, Whitney CDP, and Winchester CDP.

Table 3.17-5 Population in the Social and Economic Analysis Area 2000 and 2010, by Region

Region*	2000 Pop. (Census)	2010 Pop. (Census)	Net Change	Percent Change	Communities with 2,000 or more Residents**
IV	1,375,765	1,951,269	575,504	41.8	Boulder City, Enterprise CDP, Henderson, Las Vegas, Laughlin CDP, Mesquite, Moapa Valley, Nellis AFB, North Las Vegas, Paradise CDP, Sandy Valley CDP, Spring Valley CDP, Summerlin South CDP, Sunrise Manor CDP, Whitney CDP, and Winchester CDP.

* The geographic definition of the regions results in some double-counting of population between regions. The double-counting is most pronounced between Regions III and IV due to inclusion of Clark County, Nevada, in each region.

** The list includes incorporated cities and towns and unincorporated communities with more than 2,000 residents that are recognized as Census Designated Places (CDPs) by the U.S. Census Bureau. CDPs are closely settled, named, unincorporated communities that generally contain a mixture of residential, commercial, and retail areas similar to those found in incorporated places of similar sizes. Each CDP contains an identifiable core encompassing the area that is associated strongly with the CDP name and contains the majority of the CDP's population, housing, commercial structures, and economic activity. Not included in the list are the numerous smaller communities and settlements located with the analysis area.

Source: U.S. Census Bureau 2011a.

3.17.4.1 Region I

Region I is comprised of four counties in south-central Wyoming and northwestern Colorado. In 2010, the total population of the region was 96,995, a net increase of 12.7 percent compared to the 2000 population (**Table 3.17-5**).

The region's economy is heavily dependent on energy-resource development, including oil and gas, coal, trona and other mineral mining, and electrical generation and transmission. Due in large part to that reliance, the contemporary history of the region is characterized by periods of economic expansion and contraction. Tourism and outdoor recreation also are important contributors to the regional economy – portions of the I-80 corridor, Flaming Gorge National Recreation Area (NRA), Dinosaur National Monument, the Medicine Bow and Ashley national forests, and extensive public lands managed by the BLM are located in Region I. Hunting and fishing, by residents and visitors alike, are important outdoor activities in much of this region. Farming and ranching, the latter heavily reliant on grazing on BLM and USFS lands, is important to the region from an economic, land use, and cultural perspective.

Oil and gas development, including substantial pipeline and other ancillary infrastructure development, has been a dominant factor influencing socioeconomic conditions across the region in recent years. That development has supported economic expansion, low unemployment, and higher wages and income for residents, along with population immigration, new housing development, expansion of the retail trade and service industries, and expansion and improvements of public community infrastructure and services in many communities within the region, including Rawlins, Wamsutter, Rock Springs, Vernal, and Rangely. Several wind energy projects also have been built and are operating in the region.

The national economic recession and sharp declines in natural gas prices (among other potential factors) slowed the pace of energy development in the region dramatically. As a result, employment declined and unemployment increased. Nonetheless, more than 69,675 jobs were reported in the region in 2009, with nearly 6,500 construction jobs reported as reflected in **Table 3.17-6**. Unemployment rates, estimated at 8.0 percent across the region in 2010, more than double the rates of a few years earlier, remained substantially below the national average of 9.6 percent.

Table 3.17-6 Selected Economic Characteristics in the Social and Economic Analysis Area, by Region

Region	Total Employment - 2009 (REIS)	Total Construction Employment 2009 (REIS)	Total Farm Employment 2009 (REIS)	Annual Avg. Unemployment No. and Rate - 2010
I	69,675	6,487	1,805	6,614 / 8.0% (est.)
II	475,996	43,371	12,088	36,568 / 8.5% (est.)
III	1,187,353	77,955	3,086	156,393 / 14.7% (est.)
IV	1,082,964	75,809	241	147, 510 / 15.2%

Sources: U.S. Bureau of Economic Analysis, 2011 and Bureau of Labor Statistics, 2011.

The economic downturn had far reaching consequences for social conditions in the region as well. Many households were affected by declining incomes, many unemployed left the area, new home construction virtually stopped, local governments adjusted to declining revenues by trimming staff and services, and businesses closed. These changes affected social relationships and the lifestyles of individuals and households. Social institutions and organizations also were affected.

One legacy of energy development and tourism and outdoor recreation travel in recent years is the expansion of the hospitality industry and the bolstering of the retail trade sector across the region, According to the U.S. Census Bureau County Business Patterns, there were a total of 353 motels, hotels, private RV/campgrounds, restaurants and other eating and drinking locales in Region I (**Table 3.17-7**). Together the motels, hotels, and RV/campgrounds offer nearly 9,500 rooms and spaces (**Table 3.17-8)**. Most of those establishments are located in the larger towns, such as Rawlins, Rock Springs, and Vernal that also function as regional trade and service centers.

Table 3.17-7 Retail Trade and Hospitality Oriented Establishments and Employment in the Social and Economic Analysis Area, County Business Patterns 2009[1]

Region	Retail Trade		Accommodations and Food Services	
	Number of Establishments	Estimated Total Employees	Number of Establishments	Estimated Total Employees
I	583	5,878	353	7,320
II	3,718	51,867	315	6,522
III	5,943	98,213	330	158,635
IV	5,644	94,865	287	158,186

[1] The geographic definition of the regions results in some double-counting of establishments and employees between regions. The double-counting is most pronounced between Regions III and IV due to inclusion of Clark County, Nevada, in each region.

Source: U.S. Census Bureau 2011d.

Table 3.17-8 Temporary Overnight Housing Capacity (Motel/Hotel Rooms and RV/Campground Spaces) in the Social and Economic Analysis Area[1,2]

Region	Motel/Hotel Rooms	RV/Tent Sites	Total Short-term Lodging Capacity
I	7,383	2,115	9,498
II	26,265	10,127	36,392

Table 3.17-8 Temporary Overnight Housing Capacity (Motel/Hotel Rooms and RV/Campground Spaces) in the Social and Economic Analysis Area[1,2]

Region	Motel/Hotel Rooms	RV/Tent Sites	Total Short-term Lodging Capacity
III	143,101	7,278	150,379
IV	140,740	6,206	146,946

[1] The geographic definition of the regions results in some double-counting of rooms and RV/tent sites between regions. The double-counting is most pronounced between Regions III and IV due to inclusion of Clark County, Nevada, in each region.

[2] The total rooms and RV/tent sites does not include bed and breakfasts or spaces at public campgrounds on the National Forest, public lands, or state parks.

Sources: Colorado Tourism Office 2011; Nevada Commission on Tourism 2011; Utah Office of Tourism 2011; Wyoming Tourism 2011.

Energy development continues in Region I, albeit at a slower pace than occurred prior to the recession, a period characterized by higher natural gas prices. Currently known resources will sustain oil and gas development for the foreseeable future. Higher energy prices for natural gas could foster an increase in new development, although the oil and gas industry is presently focusing new investments in the Bakken, Niobrara, Marcellus, and Barnett shale plays in other parts of the country.

3.17.4.2 Region II

This region encompasses 15 counties in west-central Colorado and the central tier of Utah, including the Grand Junction and Provo-Orem metropolitan areas. Region II includes the Uintah and Ouray Indian Reservation. Like Region I, energy development is a vital element of the region's economy. Such development includes active oil and gas development in the Uintah Basin, coal mining in central Utah counties, and electrical generation in multiple locations. Tourism and outdoor recreation also are important contributors to the regional economy – portions of several national forests, Arches and Capitol Reef (part) national parks and the Colorado and Dinosaur national monuments, numerous state parks, and the I-70 and I-15 corridors are located in Region II. Hunting and fishing, by residents and visitors alike, along with hiking, camping, mountain biking, OHV use, and watching wildlife are important outdoor activities in much of this region. Farming and ranching, supported by grazing on BLM and USFS lands, are important to the region from an economic, land use, and cultural perspective. As compared to the other three regions, farming accounts for a larger share of the total agricultural output in Region II. Region II includes the Uintah and Ouray Indian Reservation (Utah).

In 2010, Region II had 927,839 inhabitants, a net increase of more than 223,000 residents or 31.7 percent compared to the 2000 population (**Table 3.17-5**). The population gains were concentrated in the two metropolitan areas, in particular Provo-Orem (Utah County, Utah). The non-metropolitan counties have populations ranging from 6,666 (Rio Blanco County, Colorado) to 56,389 (Garfield County, Colorado). The Provo-Orem metropolitan area has been recognized for a high-quality of life for residents and is characterized by a relatively diverse economy, while that portion of Region II comprised of Colorado and eastern Utah are more dependent on natural resource development, tourism and outdoor recreation, and agriculture.

In 2009, employment in Region II totaled nearly 476,000 jobs, including 43,371 jobs in the construction industries. More than 3,700 retail establishments employed nearly 52,000 people to serve the needs of household and business consumers. There were 315 motels and hotels, restaurants and other eating and drinking places in Region II. The former category offers more than 36,000 rooms and RV/camping sites to meet travel and tourism needs. While many of these establishments and the associated overnight lodging capacity are located in the Provo-Orem area, recent energy development promoted expansion of the lodging base in the eastern portion of the Region.

Unemployment across Region II ranged from 6.6 percent to 10.8 percent on a county level in 2010, with an average of 8.5 percent. Although higher than unemployment in Region I, most areas in Region II continued to fare better than the nation as a whole.

3.17.4.3 Region III

Among the four regions, Region III is the most diverse in terms of socioeconomic setting, encompassing six counties in southwestern Utah and southern Nevada. The region includes Beaver County, Utah and Lincoln County, Nevada, both of which are quite rural and sparsely populated, but also the Las Vegas metropolitan area in Clark County and the St. George metropolitan area in Washington County. Clark County also is home to Nellis Air Force Base. Portions of several national forests, Zion National Park, Cedar Breaks National Monument, and Lake Mead NRA, Valley of Fire State Park (Nevada) and portions of the I-15 corridor also are located in Region III. The Paiute Indian Reservation (Utah), Moapa Indian Reservation (Nevada), Snow Mountain Indian Reservation (Nevada), Las Vegas Colony (Nevada), and a portion of the Fort Mojave Indian Reservation (Nevada) are located in Region III.

In 2010, the total population of the region was 2.16 million, a net increase of 637,551 residents (41.9 percent) over the 2000 population (**Table 3.17-5**). The population gains and the economic data for Region III are dominated by those for Clark County, among the fastest growing metropolitan areas in the nation over the past 20 years. Washington (St. George) and Iron (Cedar City) counties in Utah also realized substantial growth during the decade. The remaining three counties are sparsely populated, ranging from 5,345 to 12,503 residents in 2010.

Over time, economic development efforts in Clark County had some success in recruiting and fostering expansion of financial services, technology-oriented manufacturing, and professional services in an effort to diversify the economy and reduce its dependency on entertainment and to a lesser extent, the federal government. That success, along with climate, a reasonable cost of living, relatively abundant job opportunities, and other factors, stimulated strong migration into the area, not only by retirees, but younger, working age adults and families. At the same time, the entertainment and gaming industries set out on a dramatic expansion, fueled by general economic prosperity across the nation and in overseas areas that accounted for many international travelers to Las Vegas. The net result was a boom in residential and commercial construction. Retirement and lifestyle migration also was a major contributor to the growth in southwestern Utah. Similar to Clark County, that growth was accompanied by an increase in residential and commercial construction, and expansion of the local trade and services industries. Unemployment across the region was substantially below the national average.

Economic conditions changed rapidly in response to the economic recession, combined with the fallout of the housing mortgage crisis. Total employment in Region III was 1,187,353 jobs in 2009, over 90 percent of which were based in Clark County. The total employment in 2009 reflects a loss of more than 95,000 jobs as compared to 2007, nearly 88,000 of which had been based in Clark County, with much of that job attrition coming from the construction and related industries. Job losses in Iron and Washington counties during the same 2-year period totaled more than 7,300. Unemployment climbed to record high levels of 15.7 percent in Clark County and to double-digit levels elsewhere in Region III. Unemployment across the region averaged 14.7 percent for 2010, representing more than 156,000 unemployed.

Not surprisingly, Region III supports an extensive base of more than 150,000 hotel and motel rooms and RV/camp sites. The majority of these are in Clark County; however, nearly 3,500 rooms and RV/camp sites exist elsewhere in Region III, primarily in the St. George and Cedar City areas. The region also hosts a large base of retail trade establishments.

Some signs of economic improvement are evident in the Las Vegas area, i.e., small year-over-year increases in the overall number of visitors and overall gaming revenues. However, the timing and scale of a

broader economic recovery are highly uncertain. Although slowed, new construction and growth continue in the St. George area; that too is expected to continue for the foreseeable future.

3.17.4.4 Region IV

This region is comprised solely of Clark County, Nevada. Lake Mead NRA, Valley of the Fire State Park, and the I-15 corridor, and the area serves as a major gateway to Grand Canyon and Death Valley National Parks. As described earlier, the Las Vegas metropolitan area was among the fastest growing metropolitan areas in the nation prior to the recent economic recession, gaining more than 575,000 residents between 2000 and 2010 (**Table 3.17-5**). Approximately 40 percent of the net population growth in Clark County over the past decade occurred in Henderson in the southeast portion of the Las Vegas Valley. Boulder City is approximately five miles southeast of Henderson and the Las Vegas Valley, separated by Railroad Pass, which carries U.S. Highway 93/95. Boulder City saw virtually no growth in population between 2000 and 2010, registering a net increase of just 57 residents. The Moapa Indian Reservation, Snow Mountain Indian Reservation, Las Vegas Colony, and a portion of the Fort Mojave Indian Reservation are in Region IV.[2]

In contrast to the high-energy entertainment and casino/resort image that many associate with Las Vegas, Henderson is a suburban bedroom community, characterized by vast tracts of newer residential and consumer oriented development, interspersed with areas of light industry. Steep, hilly terrain, including the approach to Railroad Pass, constrains Henderson's expansion to the south. Henderson experienced a sharp decline in construction activity, loss of jobs for residents, declining property values, and reduced tax revenues due to the recession and housing financing crisis.

Boulder City, which served as the primary staging area for the construction of the Hoover Dam, today is a combination of bedroom, retirement, and recreation gateway community. U.S. Highway 93, which serves as the primary highway access to the Hoover Dam, crosses the recently completed Mike O'Callaghan-Pat Tillman Bridge over the Colorado River to Arizona, and an important access to the Lake Mead NRA passes through Boulder City. Retail trade and services, much of it geared toward travelers and outdoor recreational pursuits, and federal employment, are important elements of the community's economy. More so than by the recession, the Boulder City economy has been buffeted by the continuing effects of the epic, drought-related drop in water levels in Lake Mead that dramatically reduced recreation visitation and associated economic benefits for the area.

3.17.5 Impacts to Socioeconomic Conditions

This section addresses potential impacts to socioeconomic conditions in the region of study associated with the Project and the Alternative Routes, Alternative Variations and Alternative Connectors during project construction, operations and decommissioning. Socioeconomic conditions and resources addressed include short-term and long-term impacts on economic conditions, population, housing, public facilities and services, and tax revenues.

The following socioeconomic issues and concerns were identified during the agency and public scoping:

- Potential effects on local tax revenues and short-term economic benefits from temporary employment opportunities;
- Potential effects on local agricultural output (e.g., a reduction in cultivated cropland and pastureland, increased management costs, or effects on grazing on public lands due to reduction in forage quality);

[2] The Snow Mountain Indian Reservation, Las Vegas Colony, and Fort Mojave Indian Reservations are located at considerable distance from any proposed facilities associated with the TWE project.

- Potential effects to private property values, especially for agricultural lands and residential development;
- Potential economic and social effects due to project-related effects on outdoor recreation opportunities and activities, including big game hunting, camping, hiking and OHV use;
- Concern regarding potential effects on long-term economic and community development and growth based on proximity of the power line corridors to communities;
- Concern regarding the use of eminent domain and associated economic and social effects; and
- Potential effects on quality of life and other social values of residents of the regions crossed by project-related effects on land use, visual, and outdoor recreation.

Table 3.17-9 lists important assumptions and other considerations for the socioeconomics analysis.

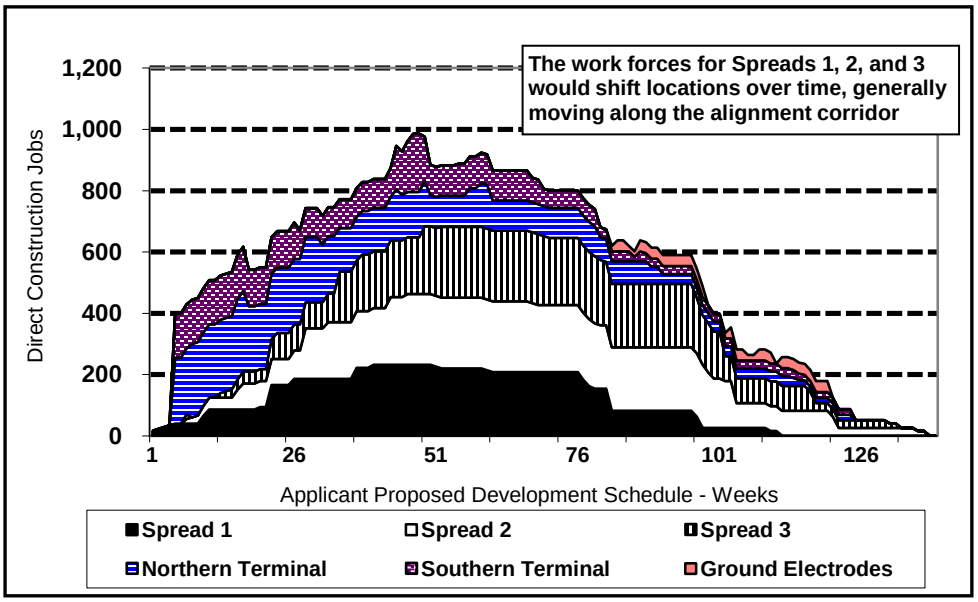
Table 3.17-9 Analysis Considerations Relevant to Socioeconomics

Resource Topic	Analysis Considerations and Relevant Assumptions
Permitting	The Project will be subject to permitting through the Wyoming Industrial Siting Administration, one topic of which will be an assessment of housing needs, resources, and project-related effects.
Economic Impacts	The direct employment requirement and construction schedule for the project would be as outlined in the PDTR. Communities in the vicinity of the common end points for Spreads 1 and 2 and Spreads 2 and 3 would not be affected concurrently by the construction workforces for two spreads. For Alternatives B and C, it is assumed that additional direct labor would be added to complete each spread within the same amount of time proposed to complete Alternative A. Delivery of non-locally procured materials and equipment to staging areas for the project is assumed to be via truck, or rail delivery to an existing rail loadout facility, with materials then trans-loaded for delivery to the site by truck.
Public Sector Revenues	Estimates of sales and use tax are derived based on the estimated project development costs provided by TransWest. Ad valorem tax revenues are addressed qualitatively.
Effects on Private and Public Lands	Based on GIS coverage and analysis of land use surface ownership. Assessment to be coordinated with Land Use (see Section 3.15)
Environmental Justice Considerations	Would there be disproportionately high human health and environmental effects of the Project on minority populations and low-income populations.

In addition to the Alternative Routes, which determine the general proximity of construction activity to nearby potentially affected communities, three other important parameters affecting the socioeconomic effects of the Alternatives are the schedule/pace of development, the direct employment requirements, and the estimated capital outlays for materials and equipment.

Construction Schedule and Estimated Direct Employment

TransWest's preliminary project development schedule calls for completion of the entire project over a 137-week period (approximately 32 months or just over 2½ years). The beginning and end of the schedule is defined by the planned construction of the transmission line, with the schedule for construction of each of the terminals and ground electrodes occurring within that timetable. **Figure 3.17-2** summarizes the overall project development schedule and direct employment, by major component, for the Project.



Source: TWE, PDTR. May 2011.

Figure 3.17-2 Projected Direct Construction Employment During Development

Direct employment associated with the construction of each spread would average approximately 140 jobs over the 2-plus year construction schedule, with a temporary peak of approximately 230 jobs. However, the work force for each spread will be distributed in different locations along the corridor such that the number of temporary nonlocal workers located at any one time, in any given location/community, would likely number fewer than 100. Although local contractors and workers could fill some of the direct needs, particularly in locations near larger communities such as Las Vegas, Grand Junction, and Provo/Orem, non-local workers would be needed in the more rural areas and to complete some of the more specialized tasks.

Not apparent in **Figure 3.17-2** is the spatial dimension of the project whereby construction on multiple components would occur concurrently, but the nexus of construction on each component would be spatially separated by substantial distances (e.g., the Northern Terminal in Wyoming, the Southern Terminal in Nevada) and move along the corridor over time. Construction of the Project under Alternative A would occur in three "spreads," each representing a major segment of the overall 725+ mile-long transmission corridor as follows:[3]

- Spread 1 for Alternative A covers approximately 221 miles, extending from the northern terminal near Rawlins, Wyoming, to a point between Vernal and Roosevelt, Utah. Spread 1 spans all of Region I and a portion of Region II. The development schedule calls for completion of Spread 1 in 111 weeks. Construction activity is anticipated to occur somewhere within Spread 1 throughout the year (i.e., timing limitations related to wildlife considerations would not result in a temporary cessation of activity across the entire spread).
- Spread 2 covers approximately 235 miles, extending across central Utah from the western end of Spread 1 to a point in the vicinity of the IPP, approximately 25 miles west of Fillmore, Utah. The proposed schedule to complete Spread 2 spans 131 weeks, commencing 7 weeks after the

[3] Note that the geographic segmentation of the spreads does not correspond directly with the four regions (see **Figures 2-21** through **2-24**).

beginning of work on Spread 1. Spread 2 covers the western portion of Region II and northern portion of Region III.

- Spread 3 covers the remainder of Region III not covered by Spread 2, and all of Region IV, extending approximately 269 miles through western Utah into Nevada, continuing to the north and west of Lake Mead, then south to the southern terminal. The schedule to complete construction of Spread 3 is 120 weeks. Construction of Spread 3 is planned to commence concurrently with Spread 2.

The lengths of the three spreads would vary for the alternative routes, resulting in corresponding changes in the development schedule and/or changes in the level of construction employment to complete the respective spreads. The differences would not be expected to substantively alter the assessment or conclusions regarding potential socioeconomic effects of the project.

A separate contract, potentially with different contractors, would govern construction in each spread. The use of three spreads allows concurrent construction in multiple locations across the overall route. In fact, due to the linear nature of the corridor and multiple activities involved (e.g., surveying, transmission tower pad construction and erection, and transmission line stringing), construction activities would occur concurrently in multiple locations in any given spread. Moreover, some construction activities can be quickly repositioned to different locations in response to weather, BLM-imposed limitations on construction for wildlife protection, or unanticipated events. The movement and distribution of the construction workforce across the spread strongly influences the scale and duration of short-term socioeconomic effects on communities in proximity to the corridor. Separate contracts also would be developed for construction of each terminal and each ground electrode system.

The overall length of the transmission line corridors for the Agency Preferred Alternative and Alternatives B and C are longer than that for Alternative A, by 100 and 173 miles, respectively (**Table 3.17-10**). The Alternative D corridors in Regions I and II are 5 miles longer than the corresponding corridors for Alternative A, and the Alternative E corridor in Region II is 9 miles longer than that in Alternative A.

Table 3.17-10 Approximate Length of the Transmission Line Corridor by Alternative Route and Region

Alternative	Miles of Transmission Line					Difference Compared to Alternative A	
	Region I	Region II	Region III	Region IV	Total	Miles	Percent
Agency Preferred	172	270	311	39	795	65	8
Alternative A	155	257	276	39	727	--	--
Alternative B	159	345	282	41	827	100	14
Alternative C	186	365	308	45	904	173	24
Alternative D	172	262	311	NA	783	56	2
Alternative E	NA	266	NA	NA	266	9*	<1**
Alternative F	NA	270	NA	NA	270	13*	<1**

Notes: NA = not applicable because the alternative corridor is not defined in the particular region.

* Difference in Regions I and II only

** The percent difference is derived by combining the alterative corridors with the corridors from Alternative A for the other regions.

Sources: TWE and AECOM 2011.

In contrast to the transient nature of construction activity along the transmission line corridors, each of the terminals and ground electrodes involve construction at a defined location over a period of time. Construction of each terminal would require approximately 28 months, with work forces to be based in the Rawlins/Sinclair area for the northern terminal and the Las Vegas Valley/Boulder City area for the southern

terminal. Construction of each of the ground electrodes, one in Region I and the other in Region III, would require about 9 months, scheduled such that completion coincides with the completion of the transmission lines and terminals. Because of their fixed location, the short-term socioeconomic effects associated with the terminal and ground electrode facilities would be similar to those with many other traditional fixed-location construction projects.

Project Development Cost and Public Sector Revenues

Construction and operation of the electrical power transmission system would generate a variety of tax and fee revenues to state and local governments. The primary sources of tax revenues associated with the construction and operation of the project would include sales and use taxes levied on taxable purchases of materials, supplies and equipment by the applicant and contractors during construction, local consumer purchases by construction workers employed on the project, including lodging expenses, and the annual ad valorem/property taxes on the transmission line and other infrastructure following completion.

The estimated project development costs for the alternatives range from approximately $2.47 billion for Alternative A to $2.78 billion for Alternative C (**Table 3.17-11**); the cost range reflecting the difference in length of transmission line. Implementation of one or more of the alternative variations, collectors or ground electrode locations could result in additional differences in development costs; however, such differences would likely be minor in comparison to the base cost of Alternative A or cost differences associated with the alternative routes.

Table 3.17-11 Approximate Project Construction Cost, By Alternative Route

	Transmission Lines**	Terminals and Ground Electrodes	Project Total	Difference Compared to Alternative A
Agency Preferred	$1 42 billion	$1.17 billion	$2.59 billion	+ $0.12 billion / 5%
Alternative A	$1.30 billion	$1.17 billion	$2.47 billion	--
Alternative B	$1.48 billion	$1.17 billion	$2.65 billion	+ $0.18 billion / 7%
Alternative C	$1.61 billion	$1.17 billion	$2.78 billion	+ $0.31 billion / 13%
Alternative D	$1.40 billion	$1.17 billion	$2.57 billion	+ $0.10 billion / 4%
Alternative E	$1.32 billion	$1.17 billion	$2.49 billion	+ $0.02 billion / 1%
Alternative F	$1.33 billion	$1.17 billion	$2.50 billion	+ $0.03 billion / 1%

** Approximate costs for transmission lines assume the same average per mile construction cost, regardless of topography, geology or other factors.

Sources: TWE (Alternative A) and AECOM (Alternatives B – F) 2013, 2012, 2011.

The capital investment associated with the project would generate sales and use tax proceeds for state and local governments during construction and become the basis for long-term ad valorem/property taxes for local governments, public education, and other special service entities with taxing jurisdiction covering the facilities. The tax generation for a specific jurisdiction would be a function of the levels of spending within the jurisdiction and applicable tax rates. Tax regulations and rates vary between the states and among jurisdictions within a state. **Table 3.17-12** summarizes the sales and use tax rates that would apply to project construction.

Based on the preliminary construction cost estimates, an assumed value of taxable material and equipment purchases equivalent to 40 to 50 percent of the total project cost and the applicable state tax rates, construction of the entire project would generate sales and use taxes on the order of $45 million to $60 million. An estimated 45 to 55 percent of that total would accrue to the state and local governments in Nevada. Taxable purchases made by the applicant and contractors in local jurisdictions that levy sales taxes, would generate additional sales and use taxes, but the amount of revenue would likely be limited in comparison to the material purchases for the transmission line, terminals and ground electrodes.

Table 3.17-12 State and Local Sales and Use Tax Rates Associated with New Industrial Construction in the Analysis Area, by State

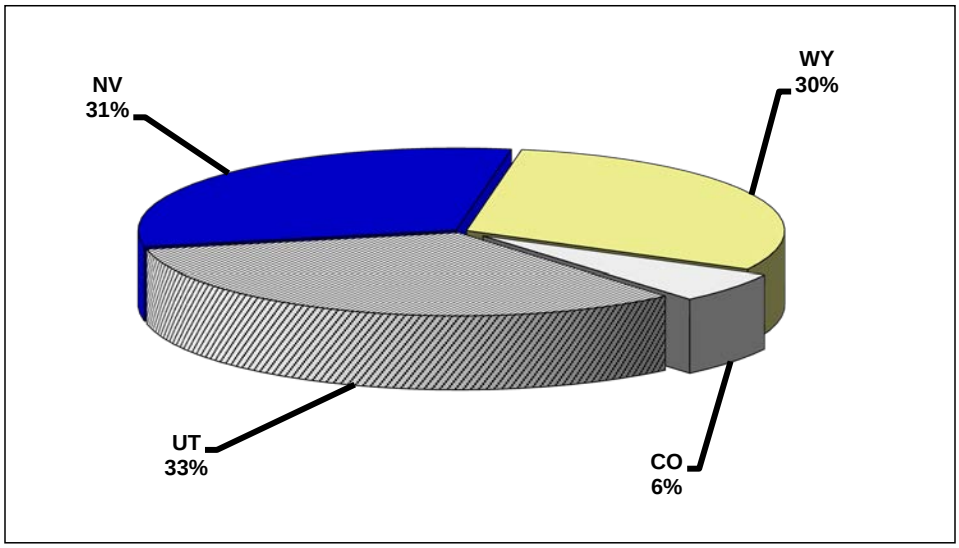
State	State Sales and Use	Local Sales and Use (Range)	Lodging Tax (Range)
Wyoming	4.0%	Local option, up to 2%	Local option, up to 4%
Colorado	2.9%	Local option, up to 4.75%	Local option, up to 2%
Utah	4.0%	Local option, up to 2.05%	State 1%, plus local option up to 5.25%
Nevada	6.85%	Local option, up to 1.25%	Local option, Up to 2%

Note: The local rates reflect tax rates for cities, counties, or a combination of the two.

Sources: Wyoming Department of Revenue; Colorado Department of Revenue; Utah State Tax Commission; Nevada Department of Taxation.

Consumer spending by construction workers also would generate sales taxes, along with lodging and other assorted taxes and fees. Again, tax rates and the application to specific types of purchases vary across the states and local jurisdictions.

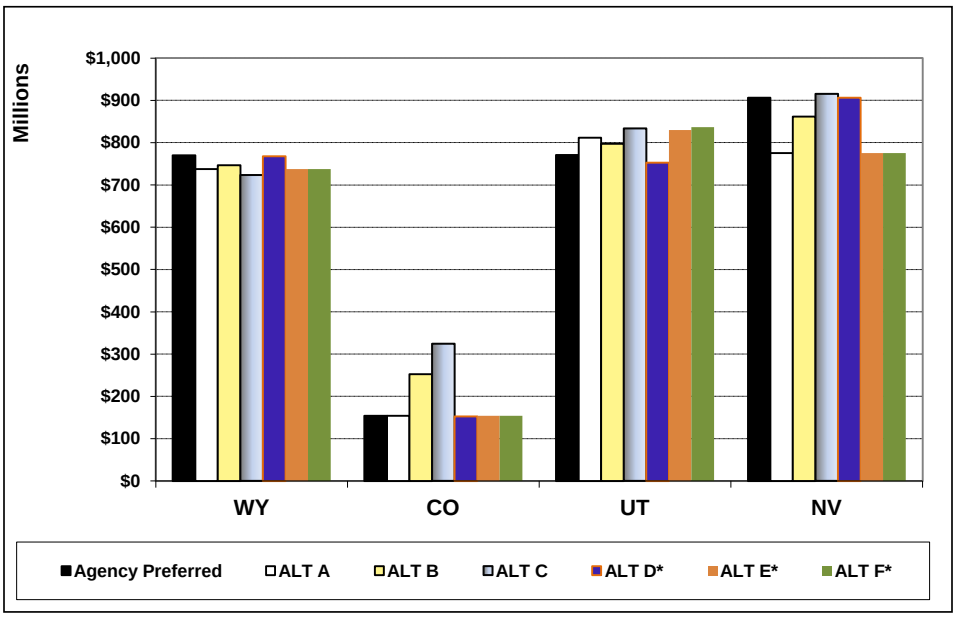
For ad valorem/property tax purposes, interstate transmission lines are assessed by the respective state revenue/taxation agencies, rather than by local assessors. The assessed valuations are determined using multiple valuation approaches, the derivation of which typically relies on information that complies with industry data reporting standards established by the Federal Energy Regulatory Commission. Project cost would likely serve as the initial basis for assessment; each state assessing the share of the total project value contributed by the facilities located within the state. Utah, Nevada, and Wyoming would each benefit from approximately one-third of the total investment, with about 6 percent located in Colorado (**Figure 3.17-3**). Virtually all of the proposed facilities would be located in unincorporated areas, limiting the future accrual of property tax revenues to local cities and towns.



Sources: TWE and AECOM 2011.

Figure 3.17-3 Approximate Geographic Distribution of $2.47 Billion Capital Investment for the Project – Alternative A

Implementation of either Alternative B or C would increase the level of investment and valuation in Colorado and Nevada, with offsetting reductions in relative terms in Utah and Wyoming (**Figure 3.17-4**). With Alternative C the share of the total capital investment in Colorado would climb to 12 percent, double that with Alternative A.



* The shifts in geographic distribution reflect the differences in costs associated with the Alternatives D, E, and F corridors in Regions I, II, and III, assuming they would be paired with the Alternative A alternatives in Region IV.

Sources: TWE and AECOM 2012, 2011.

Figure 3.17-4 Geographic Distribution of Project-related Capital Investment for the Alternatives

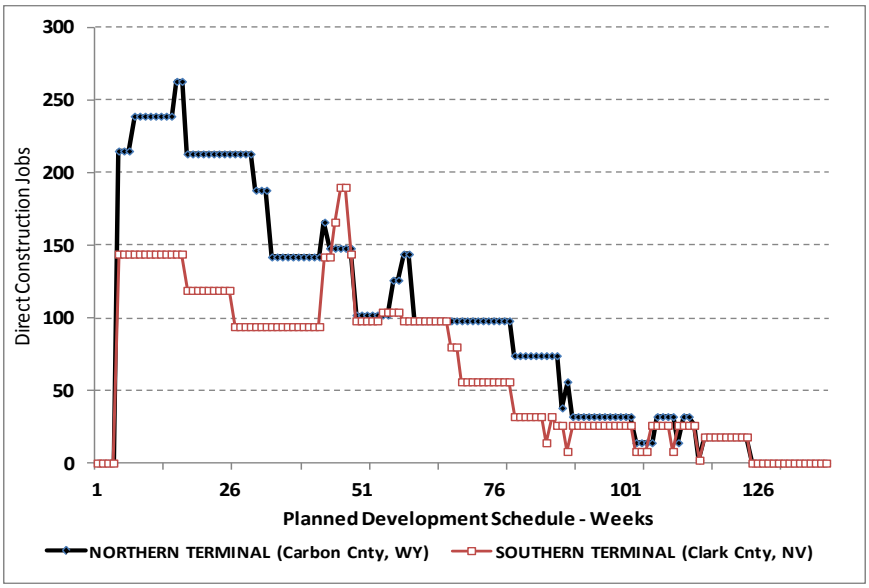
Estimates of the annual ad valorem/property tax revenues during operations were not prepared due to the a lack of information needed to project the future assessed value of the transmission system, the multiplicity of individual taxing jurisdictions affected and the respective tax rates that would apply.

3.17.5.1 Impacts to Socioeconomic Conditions from Terminal Construction, Operation, and Decommissioning

This section addresses the short and long-term social and economic effects that would arise in conjunction with the construction of the two terminals. Such impacts would include short-term increases in direct and indirect employment, and demands on temporary housing, public facilities, and public services in and near Rawlins/Sinclair and in the Las Vegas metropolitan area. Short-term effects would occur over a 27- to 28-month period for construction of each terminal. Construction activity on the terminals would occur on a year-round basis. Each of the terminals would involve construction activity at a fixed site/location, unlike the transmission line construction that would involve multiple work crews moving along the route.

Construction of the two terminals likely would involve a combination of local and non-local contractors, employing resident and non-resident workers. The local work force in Clark County, Nevada, likely would supply most of the specialized skills and trades needed to complete the terminals whereas there would be a greater reliance on non-local workers in Carbon County, Wyoming. In either instance, the non-resident workers temporarily would relocate to the respective communities given the 27- to 28-month construction period.

The work force requirements for each terminal would be highest during the first 8 to 9 months of construction, declining over time. According to the labor requirement estimates by TransWest, construction of the northern terminal is projected to require approximately 50 percent more labor than that for the southern terminal. **Figure 3.17-5** shows projected direct employment for construction of the two terminals, assuming concurrent development, illustrating the similarity in labor requirements over time as well as the higher labor needs associated with the northern terminal.



Note: Although the labor requirements for the two terminals appear together on the above figure, the two locations are approximately 580 air miles apart.

Figure 3.17-5 Direct Construction Employment for the Northern and Southern Terminals Assuming Concurrent Development Schedules

Employment: TransWest estimates that up to 263 jobs would be involved directly with construction of the northern terminal, with a peak employment of 190 jobs for the southern terminal. Peak employment associated with northern terminal could occur concurrently with the period of highest employment associated with Spread 1 (**Figure 3.17-2**). Average direct construction employment for the northern and southern terminals would be 113 and 76 jobs, respectively. Firms supplying goods and services to the project and contractors involved in construction, and those serving temporary lodging and consumer needs of workers also would benefit economically from the project. Benefits would include increases in sales, possible new business starts, and hiring additional employees or increased hours worked for existing owners and employees. It is estimated that an average of 0.7 indirect and induced jobs (together referred to as secondary jobs hereafter) would be generated in the Rawlins/Carbon County and Las Vegas Valley economies for each direct job associated with the project.[4] The labor requirements associated with each terminal are summarized in **Table 3.17-13**.

[4] Secondary employment includes two types of non-direct employment: indirect and induced. Indirect employment includes jobs supported by company and contractor purchases of goods and services from local and regional businesses. Induced employment includes jobs supported by employee spending of Project-related income and by business, local government, and school district spending in response to increased demand. Induced employment would occur across many economic sectors. The 0.7 secondary jobs multiplier is an assumption based on economic data and estimated multipliers for energy development and industrial construction projects in the Rocky Mountain/Intermountain West.

Table 3.17-13 Short-Term Employment Effects Associated with Construction of the Terminals

	Northern Terminal	Southern Terminal
Direct Construction Jobs – Peak	263	190
Direct Construction Jobs - Average over 28 months	113	76
Secondary Jobs - 0.7 x average direct	79	54
Total Direct and Secondary Jobs - Average	192	130
Total Average Employment as a Percent of 2010 Total County Employment	2%	<0.2%

Sources: TWE and AECOM.

Population and Demographics: The influx of non-resident workers to meet demand for specialized labor would result in a temporary population influx into the Rawlins and Sinclair communities (northern terminal) and Las Vegas Valley, including Boulder City (southern terminal). The size and relative scale of the population influx would depend on the availability of local residents to fill direct, indirect, and induced jobs. In the Rawlins/Sinclair area, the population influx could be upwards of 200 to 300 depending on the time of year when construction begins, the level of oil and gas development in the region at the time, and labor needs generated by other projects. Many of the non-resident construction workers relocating to the area temporarily would not be accompanied by other family members. Consequently local schools would see little increase in enrollments, and any such increase would only be over one or two school years.

Local labor likely would fill a majority of all jobs associated with construction of the southern terminal near Boulder City, Nevada, due to the larger size and mix of skilled workers available in the local labor force. Consequently, little project-related population influx would be expected in the Las Vegas Valley.

Temporary Housing: Construction of the terminals would increase demand for temporary housing in affected communities, with the timing and magnitude of demand corresponding to the influx of non-resident workers. Overall demand would be comprised of a combination of a few ownership units, conventional single family and apartment rentals, RV/camper parking spots, and motel rooms. Rental property owners and local lodging establishments who meet the needs of construction workers would realize increased revenues.

Project-related demand for temporary housing in Rawlins and Sinclair could compete with the needs from other energy development projects, including the Chokecherry-Sierra Madre wind energy project, and seasonal demands associated with business travel and tourism. The supply of temporary lodging is constrained. Thus, construction of the terminals would contribute to temporary shortages and may result in work force commuting to/from other communities. Because construction of the terminals would involve increased demand for a moderately long period, the project may stimulate investment in new temporary housing.

Little population influx is anticipated in the Las Vegas Valley in conjunction with the project. Any increase in demand could likely be accommodated by existing supply in Henderson, Boulder City, and elsewhere. Demand for RV/campground spots may compete with other tourism demands in Boulder City area, and there would be potential competition for space at the Lake Mead NRA campground, although individual visitors staying overnight are limited to 30 days per visit, 90 days total within 12 months.

Public facilities and services in Rawlins, Sinclair, and Las Vegas Valley: Public facilities and services most likely to be affected by construction of the terminals include law enforcement, emergency medical services, water, wastewater, road and bridge, and general administration. Potential effects include an increase in the number of calls on local police and sheriff departments and EMS related to motor vehicle accidents, traffic enforcement, and altercations. The incremental demand on water and wastewater systems would be similar in nature to the demands associated with tourists and travelers, which are already being

accommodated. As mentioned earlier, local school districts would not be expected to experience a significant increase in enrollments or other effects on facilities and services.

Based on recent local experience with major construction projects and the seasonal tourism and travel demand, the scale of the project-related short-term demand in Rawlins would generally be within the capacity of local service providers. Although no need for capacity expansion is foreseen at this time, following severe cutbacks in capacity during the recent recession, the City of Rawlins may interpret the project-related demand as contributing to a general need to expand service capacity.

Accounting for the available capacity and demands from tourism and travel in the metro area, the limited population influx from project related demands at the southern terminal would be well within the capacity of local service providers.

Fiscal effects for affected units of government – primarily local: Each terminal would involve an estimated $550 million investment. This investment would result in substantial short-term sales and use taxes generated by purchases of materials and supplies and sales taxes on consumer purchases by construction workers.

The tax revenue benefits of this spending for the northern terminal would accrue primarily to the State of Wyoming, Carbon County, and city of Rawlins. Additional impact assistance revenues may accrue to local governments through the future siting process of the WISD. Once operational, the terminal would become a substantial long-term increment to the ad valorem tax base for Carbon County, Carbon County School District #1, and some special districts. Ad valorem tax benefits to Rawlins would be indirect, that is, through the effect of the project in supporting or raising the valuation of homes and commercial property in the city.

Construction of the southern terminal would generate substantial short-term sales and use taxes on purchases of materials and supplies and sales taxes on consumer purchases by construction workers. The tax revenues would accrue primarily to the State of Nevada and Clark County. Long-term increases in ad valorem tax base would benefit Clark County, Clark County School District, and special districts. Ad valorem revenue benefits to Boulder City, Henderson and other communities would be indirect.

Effects on social values and quality of life: In the Rawlins area, construction and operations of the terminals could contribute to an incremental increase in dissatisfaction for some residents in Carbon County because of location and concentration of industrial construction activity in proximity to the community and construction-related traffic. Others would view the temporary activity in a favorable light given the effects associated with the recent economic recession. In the Las Vegas Valley, due to the terminal's proposed location in a sparsely populated area, construction of the terminal would generate little impact on social values and quality of life.

Due to their location, access and surrounding land uses, the completion of the terminals would have little impact on outdoor recreation, agriculture, or tourism as they relate to quality of life. The terminal may be visible from locations in the Sloan Canyon NCA.

At the northern terminal, the institutionalized population incarcerated at the Wyoming State Penitentiary potentially qualifies for consideration under EO 12898. The status of the inmate population relative to EJ is unclear. The minority/racial make-up of the population tends to be relatively high and the income status of the prison population is not material. Moreover, the state assumes some responsibility for the health and welfare of the inmates. However, the inmate population generally has less access to information and little opportunity to participate in scoping relative to land use and health and safety issues. In some instances, for instance, during the development of an RMP, such issues may not warrant much concern because of the lack of site specific development proposals and a tendency to look to prison officials to address potential concerns. In this particular instance involving a potentially hazardous, industrial use, it is unclear whether EJ concerns exist. However, no high impacts to human health or environmental quality have been identified in

conjunction with construction of the northern terminal. Potential EJ concerns do not arise in conjunction with the southern terminal due to its location in a sparsely populated rural area.

Summary: Construction of the two terminals would result in temporary increases in local employment, generating increased labor income, and sales revenue for local retail, service and other businesses in Carbon County, Wyoming, and Clark County, Nevada. The total direct and secondary employment associated with construction of the terminals would be equivalent to 2.0 percent of total 2010 employment in Carbon County and less than 0.2 percent in Clark County. The economic stimulus associated with construction would extend over approximately 28 months. Demand for specialized labor skills is likely to result in some population influx, more so in Carbon County than in the Las Vegas Valley, with corresponding demands on public facilities and services. Due to the limited scale of the population influx, no major increases in local government staffing, facility capacity, or increase in public expenditures would be anticipated to serve these demands. The states of Wyoming and Nevada, the two counties and local communities would realize one-time increases in sales and use tax revenues in conjunction with construction. In conclusion, no significant socioeconomic effects have been identified in conjunction with construction of the two terminals.

Operations Impacts

Long-term operation and maintenance of the terminals would create a small number of permanent jobs in Rawlins/Sinclair and Las Vegas Valley/Boulder City. The operations work force would be augmented by temporary contract workers, to conduct both scheduled and unscheduled maintenance and repairs. Ongoing operations of the terminals would indirectly support other jobs in the community.

The long-term operations and maintenance jobs would result in limited scale population increases, along with demands on housing and public facilities and services, including a few students in public schools. However, in and of itself, the anticipated scale of the demand would unlikely require additional capacity or staffing.

Completion of the terminal could contribute to long-term effects on social values and quality of life for some area residents. In the Rawlins area, the project could contribute to an incremental increase in dissatisfaction for some residents in Carbon County because of location and concentration of industrial activity along the southern boundary of the community. In the Las Vegas Valley, completion of the terminal may contribute to increased dissatisfaction for some residents and visitors due to concentration of development and visibility from U.S. 93/95 and the Sloan Canyon NCA.

Due to their location, access and surrounding land uses, operation of the terminals would have little impact on outdoor recreation, agriculture, or tourism as they pertain to quality of life.

Long-term fiscal effects would include the incremental addition to local ad valorem tax base, both directly and indirectly, additional fees, and incremental sales and use taxes. Carbon County, Wyoming, and Clark County, Nevada, would be the primary beneficiaries of such revenues.

Due to their location in proximity to other major electrical transmission, railroad, and other industrial and municipal facilities, the construction and operations of the two terminals would have little or no direct or indirect effect on property values in the respective communities.

Decommissioning Impacts

Decommissioning impacts would result in temporary economic and population effects in Rawlins, Sinclair, and Las Vegas Valley similar to those during construction; temporary direct and secondary job gains, short-term population influx with demands on housing and local facilities and services. These impacts would likely be of much shorter duration and smaller scale than those associated with construction.

Decommissioning would not generate sales and use taxes from the purchases of materials and equipment to the same extent as initial construction would.

Differences in Effects to Socioeconomic Conditions from Design Options or Alternative Location for the Southern Terminal

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Implementing this design option would have the following implications for socioeconomic impacts.

- The socioeconomic effects in Regions I and II would be the same as those for Alternative A.
- An increase in short-term construction impacts in Millard County due to the construction of a new AC/DC converter station. Additional investments would result in additional local tax revenues.
- An increase in short-term construction impacts in Millard or Juab counties in conjunction with the construction of a ground electrode.
- Minor temporary socioeconomic effects in Region III (Iron or Lincoln counties), over approximately a 1-year duration, associated with the construction of a series compensation station in the AC portion of the transmission line.
- Little, if any, incremental impact on long-term employment and population in Millard or Clark counties.
- Potential temporary differences in social and economic impacts (i.e., minor differences in employment) due to changes in the transmission line from DC to AC between IPP and the Eldorado Valley.
- Elimination of impacts associated with construction and operation of a ground electrode in the southern portion of Region IV (Clark County).
- Changes in short-term construction effects and long-term ad valorem tax revenues in Clark County due to the construction of a substation rather than the more costly AC/DC converter station.
- Decommissioning impacts for Design Option 2 would be similar as those for Alternative A.

Design Option 3 – Phased Build

Implementing this design option would result in short and long-term social and economic effects similar to those described above for the Applicant Proposed design, with the following differences:

- Short-term construction impacts could occur in several phases, over a more extended period. The period of time over which the phased construction would be completed is uncertain.
- The overall level of short-term employment and population influx, and the level of capital investment likely would be higher due to phased construction, with some communities experiencing a second “round” of effects. Incrementally higher short-term social and economic effects would occur in the Rawlins, Wyoming, and Delta, Utah, areas.
- Additional capital investments would result in additional tax revenues.
- Short-term effects associated with substation construction in the Rawlins area would be lower than those for the northern terminal under Alternative A, but with a second series of short-term effects occurring with the future conversion to a full converter station during Phase 2. Anticipated effects would include short-term job opportunities, demand for temporary housing, increases in business and tax revenues, increases in local traffic and demands for some services.
- Short-term socioeconomic effects would occur in northwestern Utah during Phase I in conjunction with the construction of a compensating station. The socioeconomic effects anticipated during

Phase 2 would be comparable in type, magnitude, severity, and duration to those associated with Alternative A.

- The timing of socioeconomic effects in Regions III and IV would be delayed until Phase 2, with the timing contingent upon when the phased build out is completed. Most of the anticipated effects would be comparable to those associated with Alternative A.
- Short-term socioeconomic effects, similar to those associated with Alternative A would occur in Regions I and II as construction and rigging crews convert the system from 1,500 kV AC to 600 kV DC operations.
- Demand for temporary housing and the indirect and induced demands on public facilities and services and beneficial effects on local business in the Delta area would be higher due to the construction of a substation.
- The short term socioeconomic effects associated with construction of the ground electrodes would be delayed until Phase 2.
- Fiscal benefits associated with facilities to be completed in Phase 2 would be deferred.
- Little, if any, incremental impact on long-term employment and population.
- Decommissioning impacts would likely be similar for Alternative A and Design Option 3.

Alternative Location of the Southern Terminal

Implementing this option would locate the southern terminal slightly north of the proposed location. As a result, some realignment of the transmission line would occur, which could in turn result in minor differences in temporary employment, spending, taxes, demands on housing and local facilities and services. However, the differences would be negligible in terms of the effects on local social and economic conditions.

Additional Mitigation

Additional mitigation has been prescribed to lessen the impacts described above.

SOCIO-1*: TWE must address temporary housing needs in conjunction with a Wyoming Industrial Siting Permit that must be obtained prior to the commencement of construction. That plan should address the combined housing needs during construction of the northern terminal, ground electrode, and Spread 1, particularly given potential competition for housing from other development in the area. Local officials should be consulted in the development of that plan. The housing plan should address housing needs associated with construction related indirect and induced jobs that would be supported.*

Effectiveness: Implementation of a pro-active housing plan could substantially reduce the potential for temporary housing shortages to become a source of adverse socioeconomic impacts within the analysis area, particularly during the period of peak employment. Such impacts would extend from housing to community services, public sector revenues, and social effects for workers and residents alike. The effectiveness of the plan will be contingent upon the specific elements, strategies, and programs used.

SOCIO-2*: TWE should encourage its contractors, to the maximum extent practicable, to purchase materials, equipment and supplies locally, have construction materials delivered on an FOB basis to the counties in which the materials will be utilized, and complete all reports regarding taxable purchases in a timely manner so that proper attribution of sales and use tax payments can occur.*

Effectiveness: Maximizing local purchases and promoting the correct attribution of purchases to the appropriate local governments is highly effective in insuring that local governments receive the maximum tax revenue benefit during the construction of the project. Such taxes are vital for local governments to address the temporary demands on public facilities and services.

SOCIO-3: *TWE should conduct annual coordination meetings with local emergency management officials (law enforcement, fire, health care, state prison. etc.) to review and update emergency coordination and situation management.*

Effectiveness: Such information and coordination is vital for local governments to plan public services and address public safety.

3.17.5.2 Impacts to Socioeconomic Conditions Common to All Alternative Routes and Associated Components from Construction, Operation, and Decommissioning

This section addresses the short-term and long-term socioeconomic impacts associated with construction and operation of the two ground electrode systems and the transmission line. A general overview of the short-term effects associated with construction is presented first, followed by a discussion of the long-term effects of operation. That is followed by a comparison of impacts by region and alternative.

Construction Impacts

Implementation of Alternative A would affect social and economic conditions in 16 counties in the analysis area. Social and economic conditions in many, but not all, of those counties would be affected by the selection of one of the other Alternatives or one or more routing variations. The numbers of counties affected under Alternatives B through F are 16, 15, 15, 9, and 9, respectively (**Table 3.17-14**).

Table 3.17-14 Potentially Affected Counties, by Alternative and Region

Region County, State	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**	**Alternative E**	**Alternative F**	**Routing Variations**
Region 1							
Carbon, Wyoming	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**-----**	**-----**	**XXXX**
Sweetwater, Wyoming	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**-----**	**-----**	**XXXX**
Moffat, Colorado	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**-----**	**-----**	-----
Routt, Colorado	**-----**	**-----**	**XXXX**	------	**-----**	**-----**	**------**
Region 2							
Moffat, Colorado	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----
Rio Blanco, Colorado	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----
Garfield, Colorado	-----	**XXXX**	**XXXX**	-----	-----	-----	-----
Mesa, Colorado	-----	**XXXX**	**XXXX**	-----	-----	-----	-----
Uintah, Utah	**XXXX**	-----	-----	**XXXX**	**XXXX**	**XXXX**	-----
Duchesne, Utah	**XXXX**	-----	-----	**XXXX**	**XXXX**	**XXXX**	-----
Grand, Utah	-----	**XXXX**	**XXXX**	-----	-----	-----	-----
Carbon, Utah	-----	-----	-----	**XXXX**	**XXXX**	**XXXX**	**XXXX**
Emery, Utah	-----	**XXXX**	**XXXX**	**XXXX**	-----	-----	**XXXX**
Wasatch, Utah	**XXXX**	-----	-----	-----	-----		-----
Utah, Utah	**XXXX**	-----	-----	-----	**XXXX**	**XXXX**	-----
Sanpete, Utah	**XXXX**	**XXXX**	-----	**XXXX**	**XXXX**	**XXXX**	-----
Juab, Utah	**XXXX**	**XXXX**	-----	**XXXX**	**XXXX**	**XXXX**	**XXXX**
Sevier, Utah	-----	-----	**XXXX**	-----	-----	-----	-----
Millard, Utah	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**XXXX**	**XXXX**

Table 3.17-14 Potentially Affected Counties, by Alternative and Region

Region County, State	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Routing Variations
Region 3							
Millard, Utah	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----	-----	-----
Beaver, Utah	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----	-----	-----
Iron, Utah	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----	-----	**XXXX**
Washington, Utah	**XXXX**	**XXXX**	-----	-----	-----	-----	**XXXX**
Lincoln, Nevada	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----	-----	-----
Clark, Nevada	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----	-----	**XXXX**
Region 4							
Clark, Nevada	**XXXX**	**XXXX**	**XXXX**	**XXXX**	-----	-----	**XXXX**
Total Number of Counties (duplicates eliminated)	**16**	**16**	**15**	**15**	**9**	**9**	**9**

Note: **XXXX** indicates that some portion of the corridor is located in the designated county.

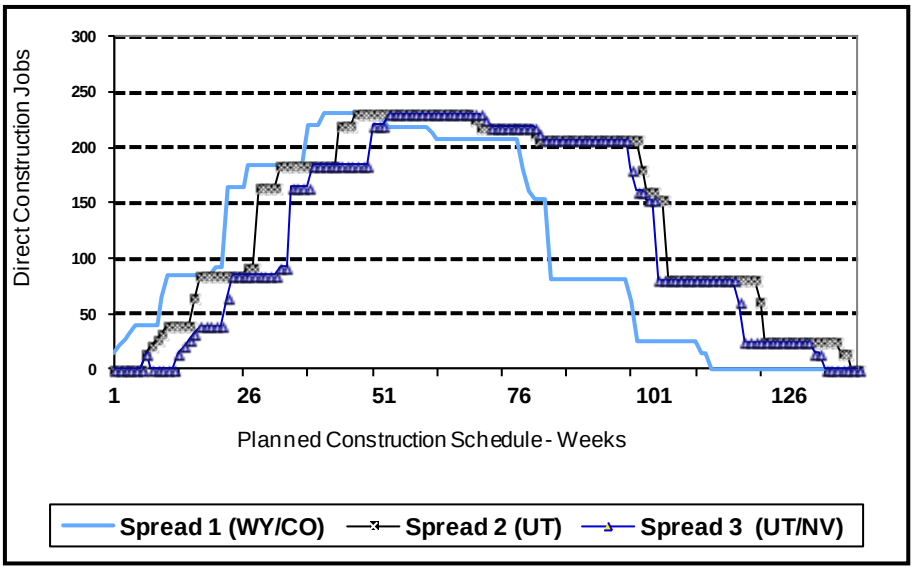
Source: TWE, 2011 through 2013.

As previously discussed, short-term construction of the transmission line would be completed using three "spreads", each comprising more than 200 miles of the overall route, and each with its own work force, fleet of construction equipment, and schedules. The use of multiple spreads means that construction activity would occur concurrently in multiple locations across the overall project route affecting different communities.

Under Alternative A, Spread 1 covers approximately 221 miles in 2 states from the northern terminal, including all of Region I and a portion of Region II. Spread 2 covers approximately 235 miles in Utah, including the portion of Region II not included in Spread 1, and a portion of Region III. Spread 3 extends approximately 269 miles through western Utah and southern Nevada to the southern terminal. Construction activity typically proceeds in a sequential fashion along a segment of the corridor, although not necessarily moving continually from one end to the other, as the total corridor could be divided into sub-segments to account for seasonal weather conditions or timing restrictions on public lands. Thus, construction activity may be occurring over 100 miles or more of the spread during the period of peak direct employment, resulting in a dispersal of the temporary effects across multiple communities.

Figure 3.17-6 portrays the project direct employment associated with each spread over time. As shown, the direct employment increases incrementally over time as new activities, including surveying, access road construction, staging area development, material and equipment deliveries, tower pad development, tower erection, stringing and reclamation are initiated, until eventually peaking at 230 jobs. Direct employment would average approximately 140 jobs for each of the three spreads over the 2-plus year construction schedule, increasing to more than 200 jobs over the "middle" 60-to-70 weeks during which most construction activity is concentrated.

Most of the temporary impacts of transmission line construction, including temporary population influxes, increased business volume for local merchants and increased sales tax revenues, would be similar in type to those associated with development of the terminals and ground electrodes. The primary differences would stem from the movement of the construction activity along the corridor over time and the associated implications for temporary housing and potential demands on emergency response as construction proceeds away from the larger towns and into more rural areas.



Source: TWE (PDTR 2011).

Figure 3.17-6 Projected Direct Construction Jobs for the Transmission Line Components of Alternative A

Due to the mobile nature of transmission line construction and the length of each segment, virtually all of the direct construction workers would qualify as non-resident and relocate temporarily for some portion of construction, relying on private RV/campgrounds and motels for housing. When available, some public campgrounds may be used, although these tend to have length of stay limits. One-way commutes of 30 to 50 miles from the place of lodging to the active work site are not uncommon for transmission line and other linear projects. In rural areas or smaller communities, contractors sometimes include parking spaces for RVs in staging areas, or ranchers and other private landowners provide parking spaces. The combination of construction activity occurring over an extended corridor, expansion and contraction of the workforce during the mid-portion of the schedule, and geographic dispersion of temporary residency, would result in lower secondary job and income generation for the transmission lines than for the terminals. Based on an employment multiplier of 0.44 secondary jobs and an average of 200 direct jobs[5], the equivalent of 89 secondary jobs are projected to be generated for each spread under construction. Like the direct jobs, the secondary jobs would be temporary, geographically dispersed along each spread, and filled through a combination of temporary hiring and extended hours for existing employees and proprietors. Many of the secondary jobs would be associated with eating and drinking places, motels and RV campgrounds, convenience stores/fueling stations, and grocery stores.

The progression of construction activity along the corridor would result in temporary population influxes in communities along the corridor. The peak population influx associated with each spread would likely be less than 250 persons, with the total generally dispersed across more than one community. Typically, the initial influx associated with surveying, staking, and road construction would be on the order of 10 to 20 workers. These tasks progress rapidly and workers commonly shift their temporary place of residence to the next community within days or weeks. The influx would climb as pad construction, tower assembly and erection

[5] The 0.44 multiplier is an assumption based on economic data and estimated multipliers for energy development and industrial construction projects in the Rocky Mountain/Intermountain West. It is lower than that used for the terminals to reflect the more temporary presence of the work force in a community, the likelihood of that work force being geographically dispersed along the corridor, and the limited availability of goods and services in the rural areas of the analysis area.

and stringing activities occur, declining thereafter. Few non-employed spouses, family members, or friends typically accompany transmission line construction workers. Given the proximity of the corridors to nearby communities, the existing highway access to/from those communities, and the pace of construction, a peak population influx of approximately 100 to 125 workers in any given community would be anticipated. Because the work sites are commonly in rural areas away from the communities, the presence of the construction work force is most apparent during the evenings.

The limited duration and scale of the temporary population influx in any community would generally not be significant when considered in the context of the current population, the number of communities in the region offering lodging, retail, and public services capable of meeting needs associated with the construction workers, and widespread experience with seasonal and other temporary demands associated with tourism and energy development. In 2010, the combined population of counties crossed by one or more of the alternatives ranged from 2.90 million for Alternative A to 2.35 million for Alternative C (**Table 3.17-15**). The combined population for Alternative D across regions I and II is lower than those for Alternatives A, B, or C, while that for Alternative E in Region II would be only slightly lower than that for Alternative A. Region I, with 73,486 residents in 2010, is the least populated. Regions III and IV, both of which include the Las Vegas metropolitan area, have the highest population.

Table 3.17-15 2010 Census Population, by Region and Alternative

Region County, State	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**	**Alternative E**
Region I	73,486	73,486	96,995	73,486	NA
Region II	694,909	317,854	256,277	154,606	683,724
Region III	2,160,024	2,021,909	2,021,909	NA	NA
Region IV	1,951,269	1,951,269	1,951,269	NA	NA
Total Population in Directly Affected Counties**	**2,902,121**	**2,386,951**	**2,348,883**	**228,092**	**683,724**

** Total adjusted to avoid double-counting of Clark County.

Source: U.S. Census Bureau 2011.

The availability of temporary lodging and essential retail and traveler services are two important indicators of the capability of local communities to accommodate a temporary population influx (**Tables 3.17-16** and **3.17-17**). Such resources are relatively abundant across the region; that abundance stemming from a combination of resident demand, past or current energy resource development, a history of outdoor recreation and tourism, and locations on a major intra or interstate highway corridor. **Table 3.17-16** lists the communities in each county having 2,000 or more residents in 2010, a population threshold defined for this assessment as indicative of a size adequate to offer essential convenience retail and consumer services to attract many temporary construction workers and accommodate them without undue stress on facilities and services and local social conditions. **Table 3.17-17** summarizes the inventory of available temporary housing in each county.

Table 3.17-16 Communities with Population of 2,000 or More, by County

County	Communities with a Resident Population of 2,000 or more
Carbon, Wyoming	Rawlins
Sweetwater, Wyoming	North Rock Springs CDP, Rock Springs, Green River,
Moffat, Colorado	Craig
Routt, Colorado	Steamboat Springs

Table 3.17-16 Communities with Population of 2,000 or More, by County

County	Communities with a Resident Population of 2,000 or more
Uintah, Utah	Maeser CDP, Vernal
Rio Blanco, Colorado	Meeker, Rangely
Garfield, Colorado	Carbondale, Glenwood Springs, New Castle, Rifle, Silt
Mesa, Colorado	Clifton CDP, Fruitvale CDP, Grand Junction, Fruita, Orchard Mesa CDP, Palisade, Redlands CDP
Duchesne, Utah	Roosevelt
Carbon, Utah	Helper, Price
Grand, Utah	Moab
Emery, Utah	Huntington
Wasatch, Utah	Heber, Midway, Park City
Utah, Utah	Alpine, American Fork, Cedar Hills, Draper, Eagle Mountain, Elk Ridge, Highland, Lehi, Lindon, Mapleton, Orem, Payson, Pleasant Grove, Provo, Salem, Santaquin, Saratoga Springs, Spanish Fork, Springville
Sanpete, Utah	Ephraim, Gunnison, Manti, Mount Pleasant
Juab, Utah	Nephi
Sevier, Utah	Monroe, Richfield, Salina
Millard, Utah	Delta, Fillmore
Beaver, Utah	Beaver
Iron, Utah	Cedar City, Enoch, Parowan
Washington, Utah	Hildale, Hurricane, Ivins, LaVerkin, Saint George, Santa Clara, Washington
Lincoln, Nevada	- None -
Clark, Nevada	Boulder City, Enterprise CDP, Henderson, Las Vegas, Laughlin CDP, Mesquite, Moapa Valley, Nellis AFB CDP, North Las Vegas, Paradise CDP, Sandy Valley CDP, Spring Valley CDP, Summerlin South CDP, Sunrise Manor CDP, Whitney CDP, Winchester CDP

Note: CDP refers to Census designated places. CDPs are closely settled, named, unincorporated communities that generally contain a mixture of residential, commercial, and retail areas similar to those found in incorporated places of similar sizes. Each CDP will contain an identifiable core encompassing the area that is associated strongly with the CDP name and contains the majority of the CDP's population, housing, commercial structures, and economic activity.

Source: U.S. Census Bureau, 2011a.

Table 3.17-17 Temporary Housing (Motel Rooms and RV/Campground Spaces), by County[1]

	Number of Hotels/Motels	Number of RV/ Campgrounds	Total Rooms/ Space	Communities with 200 or More Rooms or RV/Camping Spaces
Carbon, Wyoming	18	20	1,896	Rawlins
Sweetwater, Wyoming	28	13	2,813	Green River, Rock Springs
Moffat, Colorado	10	8	886	Craig
Routt, Colorado	23	2	3,672	Steamboat Springs
Uintah, Utah	16	16	1,139	Vernal
Rio Blanco, Colorado	19	13	575	None
Garfield, Colorado	34	12	2,583	Carbondale, Glenwood Springs, Rifle
Mesa, Colorado	42	24	4,186	Fruita, Grand Junction
Duchesne, Utah	6	22	535	None

Table 3.17-17 Temporary Housing (Motel Rooms and RV/Campground Spaces), by County[1]

	Number of Hotels/Motels	Number of RV/ Campgrounds	Total Rooms/ Space	Communities with 200 or More Rooms or RV/Camping Spaces
Carbon, Utah	10	4	711	Price
Grand, Utah	30	22	4,457	Moab
Emery, Utah	16	10	1,068	Green River
Wasatch, Utah	47	6	5,327	Heber, Midway, Park City
Utah, Utah	37	27	4,013	Lehi, Orem, Provo
Sanpete, Utah	13	7	429	None
Juab, Utah	6	12	942	None
Sevier, Utah	19	7	1,006	Richfield
Millard, Utah	10	7	596	None
Beaver, Utah	13	3	659	Beaver
Iron, Utah	22	12	1,839	Brian Head, Cedar City
Washington, Utah	68	23	5,581	Hurricane, Springdale, Saint George
Lincoln, Nevada	8	8	339	None
Clark, Nevada	272	32	146,930	Boulder City, Henderson, Las Vegas, Laughlin, Mesquite
Total Analysis Area	770	335	193,201	

[1] An unknown number of the units or spaces are available only on a seasonal basis.

Sources: Colorado Tourism Office 2011; Nevada Commission on Tourism 2011; U.S. Census Bureau 2011b;Utah Office of Tourism 2011; Wyoming Tourism 2011.

There are many smaller communities and settlements across the analysis area that may host temporary construction workers associated with the project due to their location relative to the project work sites and larger communities, highway accessibility, availability of motels and RV/camper campgrounds, or other less formal capacity to accommodate RVs/campers. The temporary population influx could represent a substantial increase as compared to the permanent population. Local businesses would see short-term activity, which can have both upside and downside effects, for instance, increases in motor fuel sales but also non-paying drive offs. Some local residents may be discomforted by the changes in the pace of life, increases in local traffic, and other effects on lifestyles.

The location of the communities in eastern and central Utah relative to the various corridors and the availability of temporary housing accommodations suggest the potential for competition between project-related housing demand and that associated with other energy development, tourism, and outdoor recreation. Such competition could temporarily strain available resources, resulting in higher costs, longer daily commutes for workers seeking housing in other locations, increased demand on local public services, and various social problems associated with informal parking and camping where not permitted. The communities affected by such competition would vary over time as project construction progresses.

Construction of the transmission line and associated component facilities would result in temporary increased demand on law enforcement and emergency medical responders across the region. Response time to accidents or other calls for service in rural locations could be lengthy, and demands could stress the capabilities of volunteer-based responders, reduce service coverage in other portions of a responder's service area. Much of the burden for law enforcement would fall to the respective state patrols and county sheriffs. Due to the short-term nature of the increases, increases in staffing would be unlikely.

Depending on existing highway access, the increase in light and heavy duty traffic associated with project construction could result in short-term demand for additional highway, road and bridge maintenance for the respective states, counties, and municipalities. Project-related traffic volume following the completion of construction would be very low, contributing little incremental demand for maintenance. Following the completion of construction few, if any, project-related access roads would become permanent roads to be maintained by the respective states or local governments.

Construction of the transmission line would generate short-term sales and use taxes associated with the purchases of materials and supplies associated with the transmission line system and sales and lodging taxes on purchases by construction workers. Estimates of the magnitude of these revenues are not available, but these tax revenues would accrue primarily to the three state treasuries and the counties in which the facilities would be located, and the counties and cities temporarily hosting workers. Additional impact assistance revenues may accrue to local governments in Wyoming as a result of the required ISA process.

Other socioeconomic effects related to construction of the transmission lines could include the following:

- Temporary and limited long-term demand for state and local road maintenance could increase on roads relied upon for access to more remote areas by workers, movement of construction equipment, and construction material deliveries (see Section 3.16, Transportation).
- Farming and ranching operations with grazing permits on BLM and USFS lands could experience temporary and long-term economic effects associated with reductions in grazing forage quantity and quality, need for increased management effort and cost, livestock injury, or adverse effects on animal weight gain. Although the overall effects would be limited in scale given the scale of projected disturbance relative to the total rangeland in the affected area, some individual operators could experience a disproportionate share of the economic effects (see Section 3.14, Land Use).
- Farmers and ranchers operating on private lands could experience short and long-term economic effects associated with isolated incidences of temporary and long-term disruption of established farming and grazing practices due to construction activities and the locations of transmission line and other facilities. The magnitude of such effects would be mitigated through design features and mitigation (see Section 3.14, Land Use) and by financial payments for right-of-way easements to affected property owners.
- Temporary effects to outdoor recreation use and experience, including hunting, OHV use, camping and hiking may occur near active construction and along key road access corridors.
- Temporary indirect economic effects on local communities resulting from effects on outdoor recreation, potentially including disruption of access, routes, or other types of conflicts with special OHV and other scheduled recreation events, and big game hunting as construction proceeds along the corridor. The extent of such conflicts would be addressed through coordination between TransWest and the BLM FOs and **REC-4**, **REC-5**, and **REC-7** (see Section 3.13, Recreation Resources).

Real Estate Property Values

Concerns regarding the potential direct and indirect effects of new transmission lines on real estate values, particularly residential and agricultural properties, are common.

Direct effects attributed to changes in land use associated with the development of physical facilities and access, constraints on development associated with right-of-way easements, or the effect of an easement with respect to the efficiency and cost of agricultural operations have been widely recognized. Such effects are typically addressed during the easement acquisition process on public lands, and in negotiations with private landowners. Over the years, procedures and methods for determining the compensation or value of

the change in values have been established. These procedures, based heavily on real estate appraisal practice and economic and accounting practices, consider the existing and foreseeable highest and best use of a property, its size, location, access, shape, zoning, the portion of a parcel affected, and other factors.[6]

Direct effects can be either short-term, for example, disruption of agriculture grazing or crop production during construction, or long-term, for example, the loss of production due to lands associated with the transmission tower. The compensation provided in return for an easement or fee simple acquisition of property theoretically reflects the economic value of the short and long-term changes in land use from a market perspective. Negotiated settlements also may account for non-economic factors as well. Direct effects on private property values are generally recognized and limited to the ROW corridor or lands used or acquired for purposes of construction of long-term support facilities.

Potential direct or indirect effects on public lands are not captured by changes in market values, but rather represent potential trade-offs in use or effects on other resources. In some instances, the potential for impacts is recognized in land management plans and those plans limit where transmission lines can be built.

Conversely, once in place, the location of transmission lines, pipelines and other facilities on public lands can affect future land management or land uses, including the marketability and desirability of public lands designated for potential future disposal to support community development.

Concerns regarding the indirect effect focus on nearby properties. Historically, the term “nearby” referred to properties immediately adjacent to, or within a very short-distance of the right-of-way. In part, that focus reflected concerns regarding potential electro-magnetic field (EMF) related health effects on humans and livestock. More recently, interest in the visual effects has tended to expand the potential area of concern for powerlines, particularly for high voltage lines. The studies reviewed, while having some inconsistencies in their detailed results, generally pointed to small or no effects on sales price due to the presence of electric transmission lines. Some studies found an effect but this effect generally dissipated with time and distance (i.e., with little effect beyond 0.25 mile), even when views are completely unobstructed. The effects that were found ranged from approximately 2 to 9 percent. Most studies found no effect and in some cases a premium was observed. This was attributed to the additional open area usually behind the residence created by the transmission line easement. These relatively small effects are somewhat in contrast to concerns and perceptions expressed in the surveys reviewed here (Jackson and Pitts 2010). The Jackson and Pitts review goes on to conclude that perceptions, even if erroneous, still matter as the perception that a property value has declined, or might decline, can be a real social effect on an individual’s sense of well-being.

At least one study noted an improvement in market prices, suggesting that the effects of a corridor in limiting other nearby development, was a type of amenity. However, most studies suggest caution in generalizing their findings, noting that other factors, including the specifics of a particular market and the intervening topography are more important in determining values. Another factor that does not appear to have been addressed in empirical studies is the potential influence on property values of the presence of one or more existing lines, as is common along much of the proposed corridors. Existing empirical studies also do not account for potential effects on personal use or enjoyment of existing owners.

Based on the literature review cited, the potential for effects would be the highest, albeit very limited even then, in communities and locations with substantial residential development where the corridor is in close proximity to such development. The more rural and less developed the area, the lower the potential for property value impacts (Jackson and Pitts 2010).

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[6] See the Gateway West Transmission Line Draft EIS (Pgs. 3.4-55 to 57) for a discussion of property value impacts.

Environmental Justice

Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (USEPA 1998). Implementation of EO 12898 for NEPA requires the following steps:

1. Identification of the presence of minority and low-income populations and Indian Tribes in areas that may be affected by the action under consideration.
2. Determination of whether the action under consideration would have human health, environmental, or other effects on any population.
3. Determination of whether such environmental, human health or other effects would be disproportionately high and adverse on minority or low-income populations or Indian Tribes.
4. Provision of opportunities for effective community participation in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of public meetings, crucial documents, and notices (CEQ 1998).

With respect to the first criteria, there are three Indian Reservations located near one or more of the alternatives: the Uintah and Ouray Indian Reservation, a segment of the Paiute Indian Reservation in southwestern Utah, and the Moapa Indian Reservation near the Las Vegas Valley in southeastern Nevada. The largest of these is the Uintah and Ouray Indian Reservation in northeast Utah. Alternative A would cross a small portion of the Reservation, paralleling an existing line through an area of semi-rural development characterized by a combination of energy resource development, agriculture, and scattered residential and industrial development. Note that the Reservation is not a large, contiguous area, but a series of larger and smaller tracts, some of which are contiguous to others, while many others are surrounded by non-Reservation lands. Alternatives II-D, II-E, and II-F also would cross small portions of the Uintah and Ouray Reservation (see Section 3.14, Land Use). No lands that are part of the Paiute Reservation would be crossed by any of the alternative routes. Alternative B would cross approximately 14 miles of the Moapa Indian Reservation in southern Nevada, paralleling several other linear projects through an established utility corridor, as well as I-15 and the Union Pacific Railroad ROW. The crossing of the Moapa Reservation must be negotiated between TransWest and the Moapa Tribe. The Tribe has the authority to negotiate the location, management, and compensation for the transmission line across the Reservation and could choose to deny the application to cross their Reservation.

A detailed analysis of household income in proximity to the corridors is beyond the scope of this analysis. Nonetheless, given the variations in personal income among the counties, communities, and rural areas across the length of the alternative corridors, there are may be localized areas with higher shares of low income population than characterizes the corresponding county or state as a whole. However, consideration of the overall length of the corridors, combined with the avoidance of concentrated population such that the numbers of residences in close proximity to the reference lines are small (see Section 3.14); that the Moapa Tribe has authority to negotiate location and other conditions for the line to cross the Reservation; and, that no high and adverse effects to human health or other environmental resources have been identified as part of this assessment, effectively minimizes the potential for disproportionate affects to low-income populations or members of the three affected tribes or Reservations.

Additional Mitigation

Additional mitigation has been prescribed to lessen the impacts described above.

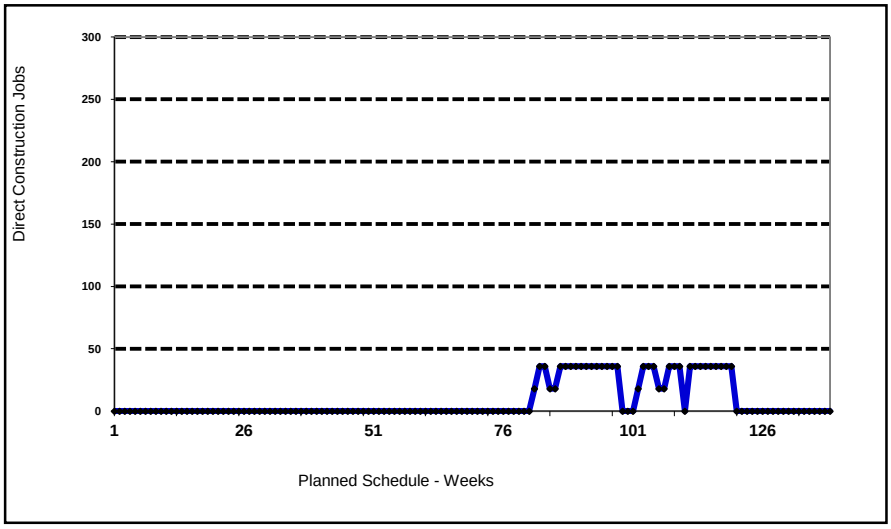
SOCIO-3: *See Section 3.17.5.1, Impacts from Terminal Construction and Operation.*

***SOCIO-4**: If not required by existing regulations or included in the various operations plans to be developed (see Section 2.4), TWE should develop and implement a plan for on-going communications with local county and municipal governments to inform them of construction progress, specifically as it relates to the anticipated timing of activity across each spread.*

Effectiveness: Advanced and on-going coordination and communication with local officials has been shown to be a key element to reducing frictions between communities and construction projects, working to the benefit of all parties.

3.17.5.3 Impacts to Socioeconomic Conditions from the Construction and Operation of the Ground Electrode Systems

Temporary socioeconomic impacts also would occur in conjunction with construction of the two ground electrodes, one in the general vicinity of the Northern Terminal (i.e., near Rawlins, Wamsutter, or in north-central Moffat County, Colorado), and the other in Region III northeast of the Las Vegas Valley. These impacts would be short-duration and limited in scale because construction of each electrode would involve fewer than 20 direct workers for a period of 7 to 8 months as depicted in **Figure 3.17-7**, with the activity occurring following the peak employment associated with the two terminals and the peak employment associated with the two transmission line spreads that would be built in the same area (**Figure 3.17-2**).



Source: TWE, PDTR, 2011.

Figure 3.17-7 Direct Construction Jobs for the Ground Electrode Components

Six alternative locations have been identified for the northern ground electrode site, three for the southern site. The duration of construction could vary slightly between alternative locations due to terrain and the length of the access road required for access from existing highways or the access road built to support transmission line construction. The differences would not affect the fundamental conclusions of the assessment.

The economic stimulus associated with construction of the ground electrodes would support approximately 10 additional secondary jobs in nearby communities. Some of the jobs may be filled by non-residents, but because construction is scheduled to occur following the peak activity on the terminals, some of those workers may already be in the area, limiting the potential incremental population influx or other noticeable socioeconomic effects.

Due to the locations and size of area required, there would be limited impacts on outdoor recreation and agriculture associated with the ground electrode construction, but could involve temporary disruption of current rangeland use.

Operation Impacts

There would be limited direct long-term economic impacts, characterized by a few direct jobs and limited taxable purchases. Communities near the ground electrodes would be largely unaffected because the management and operation of such facilities relies heavily on technology that allows the operations workforce to be located in a few select communities. Direct employment would be augmented occasionally be temporary contract maintenance employees, providing temporary economic stimulus to the local economy.

Potential long-term indirect economic impacts would be on agriculture and recreation opportunities and experience, although the degree would depend in large part on current agricultural activities and the character of the recreational setting.

Very limited or no long-term population effects would be anticipated across most of the corridor. Most communities would be unaffected. Population related effects, including impacts on school enrollment, housing, and demands for facilities and services, would be minimal.

Completion of the transmission lines would result in long-term increases in ad valorem tax base for the counties where the line is located. Some special districts and school districts also may realize tax revenue from the project. Because few if any increases in long-term expenditures would be required in conjunction with the transmission line, the long-term effects on public sector fiscal conditions would be positive, but modest in scale.

On balance, there would be long-term social impacts in some locations, due to effects on open space, recreation, agriculture, and sense of place.

Decommissioning Impacts

Decommissioning would result in short-term employment and population effects similar to those during construction. Decommissioning impacts would occur across all regions, and could occur concurrently in multiple locations.

Temporary demands on housing and public facilities and services would be a function of the size of workforce and duration of the decommissioning activities.

Demand on local/regional solid waste disposal facilities could increase to accommodate disposal of solid waste. However, a substantial quantity of the materials may be recycled, which would result in those materials being transported from the region.

State and local governments would see some sales and use tax revenues from decommissioning in conjunction with work force spending. Local governments would lose benefits of the associated ad valorem tax base.

Decommissioning could result in another iteration of changes in land use, recreation, and agriculture, or conversion to a ROW for another purpose. The type, timing, and effects of the change are uncertain.

3.17.5.4 Region I

This section summarizes the temporal and geographic distribution of impacts as construction moves along the alternative routes, and the implications of that movement for affected communities.

Key Project Parameters of the Project Affecting the Assessment

Transmission Lines

- Approximate time to complete transmission line components in Region I: 80 weeks.
- Direct Construction Employment: Range: 15 to 231, Average: 203. The total consists of multiple distinct crews (survey, clearing, foundation construction, stringing, etc.) that will be spaced out at multiple geographically dispersed locations along the ROW. At times, the spacing, when combined with limited availability of temporary housing, would result in multiple communities being affected simultaneously.
- Operations Employment: few direct permanent jobs over the operating life of the line.
- Secondary Employment: the equivalent of approximately 89 jobs, based on the average direct employment. Very few during operations. The secondary jobs related to construction would be temporary and geographically dispersed across the region based on the location of construction activities and residency patterns of the temporary construction workers.

Ground Electrode

- Approximate time to complete the ground electrode in Region I: 9 months. Completion of the ground electrode expected to follow the completion of the construction of the transmission line in Region I. This work force is independent of that for the transmission line, but activity would be concurrent with construction of the northern terminal.
- Direct Construction Employment: Range – 12 to 18.
- Operations: few, if any, direct permanent jobs over the operating life of the ground electrode.
- Secondary employment: Approximately 10 jobs during construction. Temporary effects likely concentrated in one or two communities, depending on the final site selection.

Decommissioning Impacts

- Temporary employment impacts, along with impacts on temporary housing. Sales and use tax based primarily on work force spending, because of limited purchases of materials. See discussion under terminals above.

Summary of Impacts

Table 3.17-18 compares the impacts associated with the alternative routes in Region I after consideration of BMPs, design features, and mitigation measures.

Four alternative connectors have been defined in Region I, all located between I-80 and the Wyoming-Colorado state line. **Table 3.17-19** summarizes impacts associated with the alternative connectors in Region I.

Table 3.17-20 provides a comparison of alternative electrode bed locations proposed near the northern terminal. Some locations might serve multiple alternatives, while others are only associated with a single alternative. Differences in effects primarily reflect proximity to other land uses and outdoor recreation opportunities.

Table 3.17-18 Summary of Region I Alternative Route Impacts for Socioeconomics

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Geographic distribution (differences carry through other parameters)	Direct effects in Wyoming and Colorado	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A
Approximate length of corridor (miles)	155	159	186	171
Approximate duration of construction: 80 weeks				
Direct and secondary jobs	Short-term: 292 average Short-term jobs would be distributed among multiple work sites and communities. Long-term: < 20 (assumed)	Short-term: Slightly higher than Alternative I-A Long-term: Same as Alternative I-A	Short-term: 10% to 20% higher than Alternative I-A. Long-term: same as Alternative I-A	Short-term: 5% to 15% higher than Alternative I-A. Long-term: same as Alternative I-A
Population influx	Short-term: Less than 250 (peak) Short-term population influx likely would be dispersed among several communities at any time. Primary communities affected include Rawlins, Wamsutter, Baggs, Dixon, Craig, and Rangely. Long-term: little, if any	Short-term: Essentially the same magnitude as Alternative I-A Long-term: Same as Alternative I-A	10% to 20% higher than Alternative I- A Slightly longer and higher effects in Rawlins, Baggs/Dixon and Craig, lesser impact in Wamsutter	5% to15% higher than Alternative I- A Slightly longer and higher effects in Rawlins and, Baggs/Dixon and lesser impact in Wamsutter
Short-term housing demand	Good supply in Carbon and Sweetwater counties, but some locations require longer commutes to access temporary housing opportunities. Short-term housing availability more limited in Moffat County.	Same as Alternative I-A	Higher demand than Alternative I-A. Commuting to housing may be easier because of highway access.	Higher demand than Alternative I-A. Commuting to housing may be easier because of highway access.
Short-term effects on public facilities and services	Minor short and long-term effects on road maintenance, law enforcement, and emergency response. Much of the area accessible via oil and gas roads.	Comparable to Alternative I- A	Lesser impact on local road maintenance. Access reduces potential effects on emergency services.	Comparable to Alternative I- A

Table 3.17-18 Summary of Region I Alternative Route Impacts for Socioeconomics

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Effects on public sector revenues	Short-term: Substantial sales and use taxes accrue to states and counties. Not quantified, but in the millions Sales and lodging taxes from worker spending, primarily in Carbon and Sweetwater (WY) and Moffat (CO) counties Long-term: Increase in ad valorem/ property taxes benefitting primarily counties, public education and some special districts. Federal and perhaps state governments would realize ROW rental/ lease revenues.	Comparable to Alternative I-A	Direct: 10% to 20% higher than Alternative I-A Larger share in CO, lower share in WY Worker spending taxes higher	Direct: 5% to 15% higher than Alternative I-A Larger share in WY, lower share in CO Worker spending taxes higher
Potential effects on private agricultural production, including grazing on public lands	Impacts to agriculture primarily associated with grazing on public lands	Comparable to Alternative I-A	Less impact on public grazing, higher potential for impact on irrigated farming and ranching	Comparable to Alternative I-A
Potential economic effects due to conflicts with outdoor recreation	Much of the area already affected by oil and gas development	Comparable to Alternative I-A	Less impact due to proximity to improved highway	Comparable to Alternative I-A
Effects on social values	Most of the corridor either co-located near other linear development or remote and sparsely populated	Comparable to Alternative I-A	Highest potential impact due to proximity and visibility from highways and private lands	Comparable to Alternative I-A
Effects on Property Values	Limited due to location relative to private property	Limited due to location relative to private property	Higher than Alternative I-A, but still limited due to location relative to private property	Limited due to location relative to private property
Potential Environmental Justice concerns	None, although facilities located near the Wyoming State Penitentiary	Same as Alternative I-A	Same as Alternative I-A	Same as Alternative I-A

Table 3.17-19 Summary of Region I Alternative Connector Impacts for Socioeconomics

Alternative Connector	Analysis	Advantages
Mexican Flats Alternative Connector	The connector is located in a rural, unpopulated area. Thus, there would be no appreciable differences in socioeconomic effects, despite minor differences in route length and construction costs.	This connector could reduce impacts on private lands, agriculture production, and social values in Baggs/Dixon area and Moffat County. However, would result in trade-offs as more of corridor in remote, harder to access and service areas.
Baggs Alternative Connector	Same as the Mexican Flats Alternative Connector above.	This connector could reduce impacts on private lands, agriculture production, and social values in Baggs/Dixon area (but not to the extent of the Mexican Flats Alternative Connector) and Moffat County. Trade-off would be more of corridor in remote, harder to access and service areas.
Fivemile Point North Alternative Connector	Same as the Mexican Flats Alternative Connector above.	Similar to the Baggs Alternative Connector, with slightly more benefit in Baggs/Dixon area, and same benefits in Moffat County.
Fivemile Point South Alternative Connector	Same as the Mexican Flats Alternative Connector above.	Similar to the Baggs Alternative Connector, with slightly more benefit in Baggs/Dixon area, and same benefits in Moffat County. Could be combined with portions of the Baggs Alternative and the Fivemile Point North Connectors.

Table 3.17-20 Summary of Region I Alternative Ground Electrode System Location Impacts for Socioeconomics

Alternative Ground Electrode System Locations	Analysis (Qualitative)
Separation Flat – All Alternative Routes	Relatively close to Rawlins. Within the “checkerboard” and CD-C oil and gas area, increasing the potential for isolated effects on other land uses and agriculture.
Shell Creek (Alternatives I-A, I-B, I-D)	More distant from communities and temporary housing. Within the “checkerboard” and CD-C oil and gas area. Limited fiscal differences for Sweetwater County. Potential differences in economic effects associated with big game hunting – see Section 3.14, Recreation.
Little Snake East (Alternatives I-A, I-B, I-D)	More distant from communities and temporary housing. Changes in fiscal effects because of location in Colorado rather than Wyoming. Potential differences in economic effects associated with big game hunting – see Section 3.14, Recreation.
Little Snake West (Alternative I-A)	More distant from communities and temporary housing. Changes in fiscal effects because of location in Colorado rather than Wyoming. Potential differences in economic effects associated with big game hunting – see Section 3.14, Recreation.
Eight Mile Basin – All Alternative Routes	Closest location to Rawlins, with easy highway access via State Highway 71. Located within the “checkboard” but outside of the more active oil and gas development areas located further west and also to the south. Located near Rawlins water treatment plant. Chokecherry-Sierra Madre wind project proposed for development in areas to the east and south of the site.
Separation Creek – All Alternative Routes	The Sweetwater-Carbon county line divides the site, which is relatively close to Rawlins, south of the I-15 corridor and adjacent to the Union Pacific Railroad ROW. Located within the “checkboard” but outside of the more active oil and gas development areas located further west and also to the south.

The Tuttle Easement micro-siting options provide options for realigning a short segment of the transmission line to avoid locating it in an area covered by a conservation easement that precludes utility easements. One of the options would cross approximately 200 feet of NPS-managed lands and the other would require two additional crossings of Highway 40. Either routing would not substantively alter the project costs, construction schedule, or temporary employment requirements. Hence, implementation of either option would not affect the overall assessment regarding temporary or long-term socioeconomic effects.

Differences in social and economic effects between the Alternative transmission line routes and other facilities to be located in Region I would be minor. Differences in short-term jobs creation, sales and use taxes, consumer spending, and demands on local housing and government facilities would generally be anticipated to correlate directly to the length and costs of the segments. Alternatives I-C and I-D are 20 percent and 10 percent longer than Alternative I-A, respectively, and hence more costly to build, while supporting more short-term employment opportunities. However, Alternative I-C would affect more private property and at the same time have more of its length located near established highway corridors and communities, which would facilitate worker commuting to nearby communities with temporary housing opportunities. None of the alternatives would have any substantial long-term effects on social and economic conditions in the region.

3.17.5.5 Region II

This section addresses the temporal and geographic distribution of effects as construction moves along the alternative routes, and the implications of that movement for affected communities. The assessment in Region II also considers differential effects due to differences in the existing environment (energy development, forest lands, and public/private landownership) for Alternative II-A and the I-70 corridor for Alternatives II-B and II-C.

<u>Key Project Parameters Affecting the Assessment</u>

Transmission Lines

- Approximate time to complete transmission line components in Region II: 131 weeks.
- Direct Construction Employment: Range: 15 to 231, Average: 203. The total consists of multiple distinct crews (survey, clearing, foundation construction, stringing, etc.) that would be working at multiple locations along the ROW. At times, the spacing, when combined with limited availability of temporary housing, would result in multiple communities being affected simultaneously.
- Operations Employment: few direct permanent jobs over the operating life of the line.
- Secondary Employment: the equivalent of approximately 89 jobs, based on the average direct employment. Very few during operations. The secondary jobs related to construction would be temporary and would be geographically dispersed in communities located near the route based on the location of construction activities and residency patterns of the temporary construction workers.

Ground Electrode

- No ground electrode would be located in Region II.

Decommissioning Impacts

- Temporary direct and secondary employment impacts and impacts on temporary housing. Sales and use tax based primarily on work force spending, because of limited purchases of materials. Like the construction effects for the transmission line, the effect would shift location over time.

Summary of Impacts

Table 3.17-21 provides a comparison of impacts associated with the alternative routes in Region II. **Table 3.17-22** summarizes impacts and advantages associated with the alternative connectors in Region II.

Four alternative connectors have been defined in Region II; two of the connectors are on the eastern side of the Manti-LaSal National Forest, providing facilities to crossing between Alternatives II-B, II-C, and II-D that access different routes through the Forest. Two other alternative connectors are located in the proximity of Lynndyl just east of the IPP connection. Each is relatively short in length and would result in minimal differences in socioeconomic effects, the differences essentially constituting trade-offs involving shifts in location on public and private lands that may have minimal effects on agriculture or reductions in effects to one group of landowners and uses at the expense of increased effects to another group of owners. **Table 3.17-22** summarizes impacts associated with the alternative connectors in Region II.

Two micro-siting options have been identified in Region II: the Strawberry IRA (Alternative I-A) and the Cedar Knoll IRA (Alternative II-A). Each option provides for the possible realignment of relatively short segments of the transmission line in order to avoid or reduce the length of line located within an IRA. The net effects on project cost, construction schedule or temporary employment associated with either the Strawberry IRA or Cedar Knoll IRA micro-siting options would not be substantively different than the comparable metrics for the corresponding base Alternative, I-A and II-A, respectively. Hence, selection of either option would not affect the overall assessment or conclusions regarding socioeconomic effects.

Alternative Variation in Region II

Emma Park Alternative Variation

A single alternative variation is defined in Region II – the Emma Park Alternative Variation (see **Table 3.17-23**). The variation generally follows an east-west routing, in the vicinity of an existing road that connects U.S. Highways 191 and 6. The area is mostly grassland/rangeland, rural and undeveloped, although there is some existing energy development nearby.

None of the alternatives would have any substantial long-term effects on social and economic conditions in the region. Differences in the type and scale of social and economic effects between the Alternative transmission line routes and other facilities located in Region II would be minor. As in Region I, the differences in short-term job creation, sales and use taxes, and other factors would generally correlate directly to the differences in segment length and cost. However, in Region II an important difference would be in the communities and counties affected and corollary differences in nearby land use, potential conflicts with recreation uses, and amounts of private lands potentially affected. Alternatives II-A, II-D, and II-E would cross through Uintah and Duchesne counties, which have extensive energy resource development. Substantial portions of the Uintah and Ouray Indian Reservation also are located in these counties. These alternatives continue westward, crossing areas that tend to be relatively more populated and then continuing across USFS lands. In contrast, Alternatives II-B and II-C traverse southward through western Colorado, then westward across central Utah, which is primarily rural but also includes areas with a history of coal mining and power generation, before crossing USFS lands to the IPP area.

Table 3.17-21 Summary of Region II Alternative Route Impacts for Socioeconomics

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Geographic distribution (differences carry through all parameters)	Some direct effects in Colorado, but primarily in Utah. Effects in Utah would occur across north central Utah, then south to the IPP. Land use and economies characterized by energy development, Uintah and Ouray Reservation, National Forest lands. Western portion of the corridor is more heavily populated.	Additional direct effects in Colorado and in Utah. Effects in Utah mostly along I-70 Corridor and the Green River, then jogs to northwest through central Utah to IPP. Less current energy development than Alternative II-A, trade-offs in potentially affected private lands between Duchesne and Sevier.	Additional direct effects in Colorado and in Utah. Effects in Utah mostly along I-70 Corridor and the Green River, jogs north and then south, with more corridor through USFS and less private land	Some direct effects in Colorado, but primarily in Utah. Effects in Utah would occur across north central and central Utah, jogging south to the IPP. Land use and economies characterized by energy development, Avoids much of Uintah and Ouray Reservation and more of National Forest (compared to Alternative II-A). More of corridor in Carbon County (Utah), less in Duchesne	Some direct effects in Colorado, but primarily in Utah. Effects in Utah would occur across north central Utah, jogging south to the IPP. Land uses and economies characterized by energy development, Uintah and Ouray Reservation, National Forest lands. Less effect on National Forest lands. More effect in Utah County, less in Wasatch County.	Some direct effects in Colorado, but primarily in Utah. Effects in Utah would occur across north central and central Utah, jogging south to the IPP. Land use and economies characterized by energy development, Avoids much of Uintah and Ouray Reservation and more of National Forest (compared to Alternative II-A). More of corridor in Carbon County (Utah), less in Duchesne
Approximate length of corridor (miles)	257	345	364	262	266	270
Approximate duration of construction: 131 weeks						
Direct and secondary jobs	Short-term: 292 average Short-term jobs would be distributed among multiple work sites and communities. Long-term: < 20 (assumed)	+20% to 30% as compared to Alternative II-A	+ 20% to 30% as compared to Alternative II-A	Essentially the same as Alternative II-A	Slightly higher than Alternative II-A	Slightly higher than Alternative II-A
Population influx	Short-term: Less than 250 (peak). Short-term population influx likely would be dispersed among several communities at any time. Primary communities affected include Vernal, Ballard, Roosevelt, Duchesne, Provo, Nephi, Lynndyl, Delta Long-term: little, if any	+20% to 30% compared to Alternative II-A Primary communities affected include Rangely, Fruita, Grand Junction, Moab, Green River, Castle Dale, Mount Pleasant, Nephi, Lynndyl, Delta	+ 20% to 30% as compared to Alternative II-A Primary communities affected include Rangely, Fruita, Grand Junction, Moab, Green River, Castle Dale, Ferron, Emery, Salina, Scipio, Delta	Essentially the same as Alternative II-A. Primary communities affected include Vernal, Ballard, Roosevelt, Price, Castle Dale, Manti, Lynndyl, Delta Long-term: little, if any	Slightly higher than Alternative II-A. Primary communities affected include Vernal, Ballard, Roosevelt, Duchesne, Price, Nephi, Lynndyl, Delta Long-term: little, if any	Essentially the same as Alternative II-A. Primary communities affected include Vernal, Ballard, Roosevelt, Price, Castle Dale, Manti, Lynndyl, Delta Long-term: little, if any

Table 3.17-21 Summary of Region II Alternative Route Impacts for Socioeconomics

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Short-term housing demand	Good supply in Uintah County. However, competing demands from sources may limit availability. Other communities in central Utah have more limited availability.	Areas in northwestern Colorado and central Utah with limited temporary housing availability, requiring long commuting distances, e.g., when construction occurring along I-70 and on portions of the Manti-LaSal National Forest. +20% to 30% higher demand than Alternative II-A.	Substantial stretches in western Colorado and central Utah with limited temporary housing availability (Manti-LaSal) + 20% to 30% higher demand than Alternative II-A. Commuting may be easier because of highway access.	Good supply in Uintah and Carbon counties. However, a number of stretches in central Utah with limited housing availability.	Good supply in Uintah and Utah counties. However, a number of stretches in central Utah with limited housing availability.	Good supply in Uintah and Carbon counties. However, a number of stretches in central Utah with limited housing availability.
Short-term effects on public facilities and services	Minor short and long-term effects on road maintenance, law enforcement, and emergency response.	Higher incremental demand than Alternative II-A, but effects still minor. Similar to Alternative II–A, but affect different communities, those communities generally smaller than along Alternative II-A.	Higher incremental demand than Alternative II-A, but effects still minor. Similar to Alternative II – A, affecting different, generally smaller communities, than along Alternative II-A. Access along I-70 provides an advantage	Effects comparable to those under Alternative II-A, More of corridor length crosses remote rural areas. Affects different communities in central Utah, including Price, which is larger and provides expanded service capacity.	Effects comparable to those under Alternative II-A. Corridor cross relatively less private lands and Ashley National Forest, rather than Uinta-Wasatch-Cache National Forest. Affects different communities in central Utah, including Price.	Effects comparable to those under Alternative II-A, More of corridor length crosses remote rural areas. Affects different communities in central Utah, including Price, which is larger and provides expanded service capacity.

Table 3.17-21 Summary of Region II Alternative Route Impacts for Socioeconomics

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Effects on public sector revenues	Substantial sales and use taxes, accruing to the Utah and Colorado treasuries and to local counties. Sales and lodging taxes from worker spending, primarily in Uintah, Duchesne, Wasatch, Juab and Millard counties (Utah). Long-term increase in ad valorem taxes that primarily benefit counties, public education, and special districts. Federal and perhaps state governments would realize ROW rental/ lease revenues.	Minor differences in sales, use and ad valorem taxes compared to Alternative II-A. Sales and lodging taxes from worker spending would be higher than under Alternative II-A and would accrue primarily to Rio Blanco and Mesa counties in Colorado, and Grand, Emery, Sanpete, Juab and Millard counties in Utah. Federal and perhaps state governments would realize ROW rental/ lease revenues.	Minor differences in sales, use and ad valorem taxes compared to Alternative II-A Additional sales, use and lodging taxes from worker spending, accrue primarily to Rio Blanco and Mesa counties in Colorado, and Grand, Emery, Sevier, and Millard counties in Utah. Federal and perhaps state governments would realize ROW rental/ lease revenues.	Minor differences in sales, use and ad valorem taxes compared to Alternative II-A Sales and lodging taxes from worker spending would be slightly higher than under Alternative II-A and would accrue primarily to Rio Blanco County in Colorado, and Uintah, Carbon, Sanpete, Juab and Millard counties in Utah. Federal and perhaps state governments would realize ROW rental/ lease revenues.	Minor differences in sales, use and ad valorem taxes compared to Alternative II-A Sales and lodging taxes from worker spending would be higher than under Alternative II-A and would accrue primarily to Rio Blanco County in Colorado, and Uintah, Duchesne, Carbon, Sanpete, Juab and Millard counties in Utah. Federal and perhaps state governments would realize ROW rental/ lease revenues.	Minor differences in sales, use and ad valorem taxes compared to Alternative II-A Sales and lodging taxes from worker spending would be slightly higher than under Alternative II-A and would accrue primarily to Rio Blanco County in Colorado, and Uintah, Carbon, Sanpete, Juab and Millard counties in Utah. Federal and perhaps state governments would realize ROW rental/ lease revenues.
Potential effects on private agricultural production, including grazing on public lands	Impacts to agriculture primarily associated with grazing and farming. Short-term increases in timber harvest associated with construction within national forest.	Impacts to agriculture primarily to grazing in eastern Utah and farming in western Utah. More public land affected than under Alternative II-A. Short-term increases in timber harvest associated with construction within national forest.	Comparable to Alternative II-B.	Comparable to Alternative II-A, but higher share of BLM land affected and lesser effects on National Forest lands.	Comparable to Alternative II-A.	Comparable to Alternative II-A, but higher share of BLM land affected and lesser effects on National Forest lands.
Potential economic effects due to conflicts with outdoor recreation	Some conflict potential, primarily short-term in the Ashley National Forest and Uinta-Wasatch-Cache National Forest.	Some conflict potential, primarily short-term in Manti LaSal National Forest. The Old Spanish National Historic Trail located in the area.	Some conflict potential, primarily short-term in Fish Lake National Forest.	Some conflict potential. Lowest among the alternatives.	Some conflict potential, primarily short-term in the Ashley National Forest and Uinta-Wasatch-Cache National Forest.	Some conflict potential. Lowest among the alternatives.

Table 3.17-21 Summary of Region II Alternative Route Impacts for Socioeconomics

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Effects on social values	General familiarity with such development as much of the corridor is near other linear development or passes through areas affected by other energy development. Potential for higher dissatisfaction in some locations due to proximity to second-home/recreational development. Closest to Provo-Orem metro area.	More of routes in western Colorado – area affected by oil and gas, also crosses area of oil shale resources. Close to Grand Junction metro, and I-70 corridor across Utah. Relative lack of existing linear facilities in eastern Utah may increase perceived impact on quality of life.	More of routes in western Colorado – area affected by oil and gas. Also crosses area of oil shale resources. Close to Grand Junction metro, and I-70 corridor across Utah. Relative lack of existing linear facilities in eastern Utah may increase perceived impact on quality of life.	Comparable to Alternative II-A.	Comparable to Alternative II A.	Comparable to Alternative II-A.
Effects on Property Values	Much of the corridor would be located near other linear development or through areas affected by energy development. Crosses through area of substantial private land and development in central Utah.	Corridor longer and with more public land than in corridor Alternative II-A. Corridor does not pass through any highly developed areas, thus little net difference.	Corridor longer and with more public land than in corridor Alternative II-A. Corridor does not pass through any highly developed areas, thus little net difference.	Corridor longer and with more public land than in corridor Alternative II-A. Corridor does not pass through any highly developed areas, thus little net difference.	Comparable to Alternative II-A, but character of affected lands in Carbon and Utah counties differs from that in Duchesne and Wasatch counties.	Corridor longer and with more public land than in corridor Alternative II-A. Corridor does not pass through any highly developed areas, thus little net difference.
Potential Environmental Justice concerns	Although the corridor crosses part of Uintah and Ouray Reservation, no disproportionate effects to minority or low-income populations identified.	None	None	Comparable to Alternative II-A	None	Comparable to Alternative II-A

Table 3.17-22 Summary of Region II Alternative Connector Impacts for Socioeconomics

Alternative Connector	Analysis	Advantages
Highway 191 Alternative Connector	Area is rural, with energy and transportation use (Highway 191).	Little difference from a socioeconomic perspective, although transmission line would be visible from a stretch along Highway 191.
Castle Dale Alternative Connector (Alternatives II-B and II-C)	Area is rural, with a combination of agriculture, energy, and industrial development evident.	Would avoid more forest and state lands, resulting in potential reduced conflicts with recreation. Creates shorter option compared to Alternative II-C
Price Alternative Connector (Alternatives II-B and II-D)	Area is rural, with a combination of agriculture, energy, and industrial development evident.	If connects Alternative II-B to II-C, would avoid more forest and state lands, resulting in potential reduced conflicts with recreation. None from a socioeconomic perspective if connect II-D to II-B.
Lynndyl Alternative Connector (Alternatives II-B and II-C)	Area is rural, but alternative would be more visible for I-15 travelers.	Would avoid more forest and state lands, resulting in potential reduced conflicts with recreation
IPP East Alternative Connector (Alternatives II-A and II-B)	The differences essentially constitute trade-offs involving shifts in location on public and private lands that may have minimal effects on agriculture	Little or none from a socioeconomic perspective.

Table 3.17-23 Summary of Region II Alternative Variation Impacts for Socioeconomics

Alternative Variation	Analysis
Emma Park Alternative Variation (Alternative II-F)	This alternative variation would likely have both supporters and detractors based on the potential effects on outdoor recreation, including hunting, and the fact that the alternative variation would be through an area that has more existing disturbance, affords easier road access to support construction, and carries motor vehicular traffic. The alternative variation would not substantively affect project costs, schedule, or temporary employment effect. Hence the differences in socioeconomic effects would be negligible.

3.17.5.6 Region III

This section addresses the temporal and geographic distribution of effects as construction moves along the alternative routes, and the implications of that movement for affected communities. The assessment in Region III also considers differential effects due to differences in the existing environment and public/private landownership in western Utah and southern Nevada.

<u>Key Project Parameters Affecting the Assessment</u>

Transmission Lines

- Approximate time to complete transmission line components in Region III: 120 weeks.
- Direct Construction Employment: Range: 15 to 231, Average: 203. The total consists of multiple distinct crews (survey, clearing, foundation construction, stringing, etc.) that would be working at

multiple locations along the ROW. At times, the spacing, when combined with limited availability of temporary housing, would result in multiple communities being affected simultaneously.

- Operations Employment: few direct permanent jobs over the operating life of the line.
- Secondary Employment: the equivalent of approximately 89 jobs, based on the average direct employment. Very few during operations. The secondary jobs associated with construction would be temporary and geographically dispersed across the region based on the location of construction activities and residency patterns of the temporary construction workers.

Ground Electrode

- Approximate time to complete ground electrode in region III – northeast of the Las Vegas urbanized area: about 9 months. Completion of the ground electrode expected to follow the completion of the construction of the transmission line in Region III. Thus, this work force is independent of that for the transmission line, but would be concurrent with construction of the southern terminal, although these two components would be separated by a considerable distance and intervening development.
- Direct Construction Employment: Range – 12 to 18.
- Operations: very few, if any, direct permanent jobs over the operating life of the ground electrode.
- Secondary Employment: Approximately 10 jobs. Temporary effects likely would be concentrated in one or two communities, depending on the final site selection.

Decommissioning Impacts

- Temporary direct and secondary employment impacts, along with impacts on temporary housing. Sales and use tax based primarily on work force spending. Like the construction effects for the transmission line, the effect would shift location over time.

Summary of Impacts

Table 3.17-24 provides a comparison of impacts associated with the alternative routes in Region III.

Three alternative variations are defined in the southern portion of Alternative III-A in Region III. The proposed corridor routing is in the vicinity of an existing highway, in an area with an existing transmission line. However, the Old Spanish Historic Trail passes through the area. There also is a Forest Service Road that provides motorized access into a portion of the Dixie National Forest. Two of the alternative variations would locate a portion of the corridor routing through the Dixie National Forest from east of Route 18 to west side in the vicinity of Enterprise, with the two differentiated by the location at which the corridor routing crosses Route 18. The third alternative variation would locate a portion of the corridor routing further to the east, but still within the Dixie National Forest. **Table 3.17-25** provides a comparison of impacts associated with the alternative variations in Region III.

Two alternative connectors have been identified in Region III. The Avon connector would transit an area of little development other than a Union Pacific rail line and local roads. The Moapa connector would cross to the north of I-15 in the vicinity of Dry Lake, then parallel I-15 to the south before re-crossing I-15 to the west of the I-15/U.S. 93 intersection. **Table 3.17-26** summarizes impacts and advantages associated with the alternative connectors in Region III.

Table 3.17-27 provides a comparison of seven alternative electrode bed locations proposed near the southern terminal. Some locations might serve multiple alternative routes, while others would only be associated with a single alternative route.

Table 3.17-24 Summary of Region III Alternative Route Impacts for Socioeconomics

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Geographic distribution (differences carry through all parameters)	Direct effects in western Utah (Delta, Milford, Minersville, Cedar City, Enterprise, St. George) and Mesquite, Moapa and the Las Vegas Valley.	Direct effects in western Utah (Delta, Milford, Minersville, Enterprise) and Mesquite, Moapa and the Las Vegas Valley in Nevada.	Direct effects in western Utah (Delta, Milford, Minersville, and Enterprise) and Caliente, Alamo, Moapa and Las Vegas Valley in Nevada.
Approximate length of corridor (miles)	275	282	308
Approximate duration of construction:	120 weeks		
Direct and secondary jobs	Short-term: 292 average Total short-term jobs would be distributed among multiple work sites and communities. Long-term: < 20 (assumed)	Comparable to Alternative III-A	Approximately + 10% higher than Alternative III-A
Population influx	Short-term: Less than 250 (peak) Short-term population influx likely would be dispersed among several communities at any time. Primary communities affected include Delta, Milford, Minersville, Cedar City, St. George, Mesquite, Moapa, and Las Vegas Valley. Long-term: little, if any	Comparable to Alternative III-A Primary communities affected would include Delta, Milford, Minersville, and Cedar City, in Utah and Mesquite, Moapa and Las Vegas Valley, Nevada.	+ 10% to 20% higher than Alternative III-A Primary communities affected are Delta, Milford, Minersville in Utah and Caliente, Alamo, Moapa, and Las Vegas Valley in Nevada.
Short-term housing demands	Temporary housing inventory thought to be adequate for Alternative III-A in much of this Region	Temporary housing availability more constrained and distant from the corridor for Alternative III-B in this Region, especially in Lincoln County, Nevada.	Higher demand than Alternative III-A. Temporary housing inventory is more limited in the western segment of Alternative III–C.
Short-term effects on public facilities and services	Effects on road maintenance, law enforcement, and emergency response.	Comparable to Alternative III–A, but different communities affected.	Less capacity in western segments of Alternative III-C.

Table 3.17-24 Summary of Region III Alternative Route Impacts for Socioeconomics

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Effects on public sector revenues	Substantial sales and use taxes, likely in the millions, accruing to the states of Utah and Nevada and local counties. Sales and lodging taxes from worker spending, accruing primarily in Millard, Beaver, Iron and Washington counties in Utah and Clark County, Nevada. Long-term increase in ad valorem taxes benefitting primarily counties, public education, and special districts. Federal and perhaps state governments would realize ROW rental/ lease revenues.	Minor differences in sales and use taxes compared to Alternative III-A. Additional sales and lodging from worker spending, to accrue primarily in Millard, Beaver, Iron and Washington counties in Utah and Lincoln and Clark counties, Nevada. Long-term increase in ad valorem taxes benefitting primarily counties, public education, and special districts. Higher Federal ROW rental/ lease revenues than under Alternative III-A.	Minor differences in sales and use taxes compared to Alternative II-A. Additional sales and lodging from worker spending, to accrue primarily in Millard, Beaver, Iron and Washington counties in Utah and Lincoln and Clark counties, Nevada. Long-term increase in ad valorem taxes benefitting primarily counties, public education, and some special districts. Higher Federal ROW rental/ lease revenues than under Alternative III-A.
Potential effects on private agricultural production, including grazing on public lands	Impacts to agriculture primarily associated with grazing, but also farming in Millard, Beaver, Iron, and Washington counties.	Impacts to agriculture primarily associated with grazing, but possibly also farming in Millard, Beaver and Iron counties.	Impacts to agriculture primarily associated with grazing, but also farming in Millard, Beaver, and Iron counties.
Potential economic effects due to conflicts with outdoor recreation	Potential for conflict in portions of the Dixie National Forest and Snow Canyon State Park. Segments of the Old Spanish National Historic Trail also located in the area.	The corridor is more distant from cities, and avoids Dixie National Forest and Old Spanish Trail.	The corridor is more distant from cities, and avoids Dixie National Forest and Old Spanish Trail. But more visual awareness along highways in Lincoln and Clark counties.
Effects on social values	Residents of the area generally familiar with such development. Potential dissatisfaction among some residents, particularly in Washington County, due to proximity to recreational development and visibility.	This corridor has most length in undeveloped areas and in BLM approved utility corridors	This corridor has most length in undeveloped areas and in BLM approved utility corridors
Effects on Property Values	Most of this corridor passes through undeveloped rural areas. However, some potential affect based on proximity to rural and semi-rural development in Washington County.	Virtually the entire corridor is located in undeveloped rural areas of predominately public lands. Therefore, little if any impact.	Virtually the entire corridor is located in undeveloped rural areas and predominately public lands. An exception is in the area of the Coyote Springs Planned Development in Lincoln and Clark Counties. Therefore, slightly higher potential for impacts than III-B, but less than III-A.
Potential Environmental Justice concerns	None	More, although the route passes through the Moapa Reservation, in an area that already has substantial industrial infrastructure in place.	None, although the routing comes close to the Moapa Reservation

Table 3.17-25 Summary of Region III Alternative Variation Impacts for Socioeconomics

Alternative Variation	Analysis
Ox Valley East Alternative Variation (Alternative III-A)	The alternative variation would likely have both supporters and detractors based on potential effects to recreation experience. However, the alternative does not result in substantial differences in socioeconomic effects.
Ox Valley West Alternative Variation (Alternative III-A)	The alternative variation would likely have both supporters and detractors based on potential effects to recreation experience. However, the alternative does not result in substantial differences in socioeconomic effects.
Pinto Alternative Variation	The alternative variation would likely have both supporters and detractors based on potential effects to recreation experience. However, the alternative does not result in substantial differences in socioeconomic effects.

Table 3.17-26 Summary of Region III Alternative Connector Impacts for Socioeconomics

Alternative Connector	Analysis	Advantages
Avon Alternative Connector	The area is very sparsely populated, and with little economic activity in the area. The variation would not remove the transmission line from visibility nor appreciably affect land use.	The connector would not provide any substantial advantage with respect to socioeconomic effects.
Moapa Alternative Connector	The area is unpopulated, with substantial industrial infrastructure already existing in the area. The variation would not remove the transmission line from visibility in the area, nor affect land use.	The connector would not provide any substantial advantage with respect to socioeconomic effects.

Table 3.17-27 Summary of Region III Alternative Ground Electrode System Location Impacts for Socioeconomics

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	Short-term construction effects over a period of up to 9 months. Overall scale of the impacts would be limited.
Halfway Wash- Virgin River (Alternatives III-A and III-B)	Socioeconomic effects essentially the same as for the proposed site.
Mormon Mesa- Carp Elgin Rd (Alternative III-B)	Socioeconomic effects essentially the same as for the proposed site.
Halfway Wash East (Alternatives III-A and III-B)	Socioeconomic effects essentially the same as for the proposed site.
Meadow Valley 2 (Alternatives III-C and III-D)	Socioeconomic effects essentially the same as for the proposed site. Minor differences may result from the fact that this site is north of I-15, further from Mesquite and closer to the small communities of Moapa and Logandale.

None of the alternatives would have any substantial long-term effects on social and economic conditions in the region. The differences in social and economic effects associated with the Alternatives in Region III would manifest themselves primarily in terms of the communities and counties affected in the southern extent of the region. Whereas Alternative III-A is routed through southern Utah in the general vicinity of the St. George area, then into Clark County, Alternatives III-B and III-C shift into Nevada, traversing rural areas of Lincoln County, before the routes converge north of the Las Vegas Valley. As a result, Alternative A is routed closer to communities with established highway access and relatively abundant temporary housing opportunities, while Alternatives III-B and III-C are routed through rural areas. The latter could result in short-term effects on public facilities and services for Lincoln County.

3.17.5.7 Region IV

Construction Impacts

Construction effects similar to those described above. However, the scale and incidence of impacts associated with Region IV would be tempered by the project's location within a major metropolitan area with a substantial inventory of temporary housing, good transportation accessibility, and the existing linear systems already in place. The differences between the Alternatives would arise principally in connection with the corridor locations relative to the Lake Mead NRA, and residential and commercial development in Henderson and Boulder City.

Key Project Parameters Affecting the Assessment

Transmission Line

- Approximate time to complete transmission line components in Region IV: 24 to 32 weeks.
- Direct Construction Employment: 15 to 231 Direct, Average: 203. Total consists of multiple distinct crews (survey, clearing, foundations, stringing, etc.) that would be working at multiple locations along the ROW. At times the spacing, when combined with limited availability of temporary housing, would result in multiple communities being affected simultaneously.
- Operations Employment: few direct permanent jobs over the operating life of the line
- Secondary Employment: the equivalent of approximately 89 jobs, based on the average direct employment. Very few during operations. The secondary jobs would be temporary and geographically dispersed based on the location of construction activities and residency patterns of the temporary construction workers.

Ground Electrode

- There would be no ground electrode located in Region IV.

Decommissioning Impacts

- Temporary employment impacts, along with impacts on temporary housing. Sales and use tax based primarily on work force spending, because of limited purchases of materials. See discussion under terminals above.

Summary of Impacts

Table 3.17-28 provides a comparison of impacts associated with the alternative routes in Region IV.

There is a single Alternative Variation in Region IV – the Marketplace Alternative Variation. The variation is more closely aligned with the boundary between BLM public lands and private lands in the area east of US 95 near Marketplace. As noted in **Table 3.17-29**, there are no substantial differences in socioeconomic effects associated with this variation.

Table 3.17-28 Summary of Region IV Alternative Route Impacts for Socioeconomics

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Geographic distribution (differences carry through all parameters)	Direct effects in Las Vegas Valley and Boulder City.	Comparable to Alternative IV-A	Comparable to Alternative IV-A
Approximate length of corridor (miles)	39	41	43
Approximate duration of construction: up to 32 weeks			
Direct and secondary jobs	Short-term: 292 average Most workers come from resident labor force. Long-term: < 20 (assumed)	Same as Alternative IV-A	Same as Alternative IV-B
Population influx	Little, if any, due to the availability of local labor. Generally not noticeable.	Same as Alternative IV-A	Same as Alternative IV-A
Short-term housing demands	Temporary housing availability adequate to meet any demands.	Same as Alternative IV-A	Same as Alternative IV-A
Short-term effects on public facilities and services	Little project-related impact. Adequate capacity to meet demand based on current seasonal demand already served.	Same as Alternative IV-A	Same as Alternative IV-A
Effects on public sector revenues	Substantial sales and use taxes, likely in the millions. Will accrue to the state of Nevada and local counties. Minor increase in sales and lodging taxes from worker spending in Clark County, Nevada. Long-term increase in ad valorem taxes benefitting primarily Clark County, public education, and special districts. Federal government would realize ROW rental/ lease revenues.	Same as Alternative IV-A	Same as Alternative IV-A
Potential effects on private agricultural production, including grazing on public lands	Little, if any impacts, as most of area is urbanized.	Same as Alternative IV	Same as Alternative IV-A
Potential economic effects due to conflicts with outdoor recreation	Little if any impact.	Yes, corridor located along highway corridor within Lake Mead NRA.	Yes, corridor located along highway corridor within Lake Mead NRA.
Effects on social values	Potential public dissatisfaction among Henderson residents due to the location near residential development	Potential for considerable public dissatisfaction due to the location within the Lake Mead NRA	Potential for considerable public dissatisfaction due to the location within the Lake Mead NRA
Effects on Property Values	Potential effects because of location in urbanized area	Lower potential effects because of location in less heavily developed area	Lower potential effects because of location in less heavily developed area
Potential Environmental Justice concerns	None	Same as Alternative IV-A	Same as Alternative IV-A

Table 3.17-29 Summary of Region IV Alternative Variation Impacts for Socioeconomics

Alternative Variation	Analysis
Marketplace Alternative Variation (Alternative IV-B)	Due to the concentration of existing industrial development in the area, and lack of residential development and agriculture, differences associated with this variation would be minor with respect to socioeconomic effects.

Five alternative connectors have been identified in Region IV. Four of the five connectors are located adjacent to or at least partially within the Lake Mead NRA and result in routing options that shift the corridors relative to urbanized development and public lands. The fifth alternative connector is located on the west side of Boulder City and would move the corridor further from the Railroad Pass area. **Table 3.17-30** summarizes impacts and advantages associated with the alternative connectors in Region IV.

Table 3.17-30 Summary of Region IV Alternative Connector Impacts for Socioeconomics

Alternative Connector	Analysis	Advantages
Sunrise Mountain Alternative Connector	This connector is located near the northern perimeter of the Lake Mead NRA, and represents an optional connection to enter or bypass the NRA.	Allows for trade-offs between corridor routing through the Lake Mead NRA and those through the more urbanized areas of the Las Vegas Valley, particularly Henderson, and in the vicinity of Boulder City.
Lake Las Vegas Alternative Connector	This connector is located south of Las Vegas Wash and Lake Mead Parkway, allowing for trade-offs between corridor routing through the Lake Mead NRA and those through the more urbanized areas of Henderson, and in the vicinity of Boulder City.	Reduces potential impacts in urbanized portions of the Las Vegas Valley north of Las Vegas Parkway and potential impacts to recreation areas in Lake Mead along Lakeshore Road.
Three Kids Mine Alternative Connector	This connector is located south of Las Vegas Wash and Lake Mead Parkway, allowing for trade-offs between corridor routing through the Lake Mead NRA and those through the more urbanized areas of Henderson, and in the vicinity of Boulder City.	Reduces potential impacts in urbanized portions of the Las Vegas Valley north of Las Vegas Parkway and potential impacts to recreation areas in Lake Mead along Lakeshore Road.
River Mountains Alternative Connector	This connector avoids Railroad Pass and River Mountain, shifting the corridor routing into the Lake Mead NRA in the general vicinity of developed recreation facilities and the visitor center, and also Boulder City.	There are no advantages to this connector from a socioeconomics perspective.
Railroad Pass Alternative Connector (Alternatives IV-A and IV-B)	This connector moves the transmission line corridor out of the National Conservation Area. The area is largely undeveloped and unpopulated.	Any differences associated with this variation would be minor with respect to socioeconomic effects.

None of the alternatives would have any substantial long-term effects on social and economic conditions in the region. There would be relatively few differences in social and economic effects associated with the transmission line project in Region IV because of the short-length, availability of a

large resident work force, and availability of temporary housing to house any workers who find employment on the project. The differences that would arise would primarily affect social conditions related to corridor routing through or around the Lake Mead NRA.

3.17.5.8 Residual Impacts

From a social and economic perspective, any residual effects would primarily be long-term in nature and localized within the affected counties and communities. Residual long-term socioeconomic impacts associated with the Proposed Project or other action alternatives would include effects on fiscal resources (e.g., property tax revenue), local land use affecting community development, and the social setting. The former would likely be viewed as beneficial. The latter two types of effects would be even more localized to areas in proximity to the corridor. Residual social effects would be associated with the change in character of the landscape in and near the project area, which could be viewed as adverse for some local residents and other users of these lands. The transmission line would become a factor influencing future land use development decisions along the corridor. That influence and the resulting land use patterns would be a residual impact with social and economic implications.

3.17.5.9 Impacts to Socioeconomic Conditions from the No Action Alternative

Under the No Action Alternative, the short and long-term social and economic impacts associated with the construction and operation of the transmission line, terminals, and ground electrodes would not occur. Local businesses, including retail stores, motels, and eating and drinking establishments would not realize the benefits of the economic infusions associated with the capital investment and construction labor. State and local governments would not need to respond to demand on public facilities and service, nor realize the incremental sales, use, lodging, and ad valorem taxes associated with the project. Changes in land use, including the indirect effects on agriculture would not occur. Project-related effects on social values, outdoor recreation would not occur. Future short-term effects associated with decommissioning would not occur.

3.17.5.10 Irreversible and Irretrievable Commitment of Resources

Construction and operation of the proposed TWE transmission line would require the commitment of natural, human, engineered, and monetary resources. Once completed, most of the resource investments would be irretrievable and their use/application for this project would preclude or foreclose their use for other purposes. The latter characteristic serves to make these resource commitments largely irreversible from a social and economic perspective, although, some reuse may occur following decommission.

3.17.5.11 Relationship Between Local Short-term Uses and Long-term Productivity

Construction and operation of the proposed TWE transmission line would involve a series of temporary use of land and other resources, as well as long-term influences on land use, economic activity, and social setting along the corridor. Siting the project would result in some reductions in agricultural production and perhaps displacement of some dispersed recreation use. The economic effects would include supporting jobs and incomes for local households. Communities would benefit from additional investments, and public entities, including the federal, state, and local governments, would derive revenues from the economic activities. Once operational, maintenance of the line itself would contribute to local long-term productivity, and the application of the energy transmitted via the line would contribute to substantial long-term productivity gains, albeit primarily outside of the region.

3.18 Public Health and Safety

This section includes information regarding public health and safety and hazardous materials that pertains to the area of the proposed Project. Electric transmission projects may affect public health and safety during construction and operation. Potential health and safety concerns related to power transmission during construction include worker injuries, exposure to hazardous materials, contaminated sites, or excessive noise, and other risks to workers and the surrounding community from accidents that could occur within the proposed analysis area. Health and safety concerns associated with operations include electrical shock, electric and magnetic fields, corona, stray and induced voltage, collision hazards, fire risk, and public access to transmission structures and substation equipment. Worker safety issues are associated with Project construction, operation, and maintenance activities.

Transportation-related safety issues include highway and roadway safety associated with the transport of structures, structure hardware, conductors, and employees, as well as hazards associated with proximity to airports or military operation areas and are addressed in Section 3.16, Transportation.

As with any U.S. energy infrastructure, the proposed transmission line could be the target of terrorist attacks or sabotage. Potential impacts from a sabotage or terrorism event are evaluated by analyzing the outcome of catastrophic events such as major and minor transmission line failures or accidents without determining the motivation behind the incident. Thus, such outcomes could be representative of the impacts from a sabotage or terrorism event. The level of risk is estimated based on the current conceptual design of the transmission line, applicable health, safety, and spill prevention regulations, and expected operating procedures.

3.18.1 Regulatory Background

The Project crosses many jurisdictions including federal lands managed by the USFS, BLM, NPS, DOE, DOD, and Bureau of Reclamation, state land, and county and city lands. Depending on the specific location, a number of public health and safety regulations may be applicable to various portions of the Project. OSHA has jurisdiction over most occupational health and safety issues within each state the Project crosses. Industrial construction and routine workplace operations are governed by the OSHA of 1970, particularly including 29 CFR 1910 (general industry standards) and 29 CFR 1926 (construction industry standards). While there are no federal noise regulations, municipalities and local governments may adopt laws and regulations that impose a maximum noise limit within a community. These ordinances are often enforced by police or an agency.

"Hazardous materials," which are defined in various ways under a number of regulatory programs, can represent potential threats to both human health and the environment when not properly managed. The term hazardous materials include the following materials that may be utilized or disposed of in construction and operation:

- Substances covered under Occupational Health and Safety Administration Hazard Communication Standards (29 CFR 1910.1200 and 30 CFR 42).
- “Hazardous materials" as defined under US DOT regulations at 49 CFR, Parts 170-177: The types of materials that may be used in construction and operational activities and that would be subject to these regulations would include sodium cyanide, explosives, cement, fuels, some paints and coatings, and other chemical products.
- “Hazardous substances” as defined by Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and listed in 40 CFR Table 302.4: The types of materials that may contain hazardous substances that would be subject to these requirements would include solvent-containing materials (e.g., paints, coatings, and degreasers), acids, and other chemical products.

- “Hazardous wastes” as defined in the Resource Conservation and Recovery Act (RCRA): Procedures in 40 CFR 262 are used to determine whether a waste is a hazardous waste. Hazardous wastes are regulated under Subtitle C of RCRA.
- Any “hazardous substances” and "extremely hazardous substances" as well as petroleum products such as gasoline, diesel, or propane, that are subject to reporting requirements if volumes on-hand exceed threshold planning quantities under Sections 311 and 312 of SARA. The types of materials that may be used in construction and operational activities and that could be subject to these requirements would include fuels, coolants, acids, and solvent-containing products such as paints and coatings.
- Petroleum products defined as "oil" in the Oil Pollution Act of 1990: The types of materials that would be subject to these requirements include fuels, lubricants, hydraulic oil, and transmission fluids.

In conjunction with the definitions noted above, the following lists provide information regarding management requirements during transportation, storage, and use of particular hazardous chemicals, substances, or materials:

- The Superfund Amendments and Reauthorization Act Title III List of Lists or the Consolidated List of Chemicals Subject to Emergency Planning and Community Right-to-Know Act and Section 112(r) of the Clean Air Act.
- The USDOT listing of hazardous materials in 49 CFR 172.101.

Certain types of materials, while they may contain potentially hazardous constituents, are specifically exempt from regulation as hazardous wastes. Other wastes that might otherwise be classified as hazardous are managed as “universal wastes” and are exempted from hazardous waste regulations as long as those materials are handled in ways specifically defined by regulation.

3.18.2 Analysis Area

For the purposes of public health and safety, the project analysis area is defined as a 2-mile transmission line corridor area for each of the alternative routes.

3.18.3 Occupational Safety

Worker safety in construction and industrial settings is regulated by OSHA. The proposed Project would be subject to OSHA standards during construction and operations (e.g., OSHA General Industry Standards [29 CFR 1910] and the OSHA Construction Industry Standards [29 CFR 1926]). OSHA standards are designed to protect workers from potential construction and industrial accidents, as well as to minimize exposure to workplace hazards (e.g., noise, chemicals). **Table 3.18-1** summarizes 2010 national safety statistics from the Bureau of Labor Statistics (BLS) for industry categories that are relevant to the proposed project.

Table 3.18-1 2010 National Statistics for Workplace Hazards

Industry	Nonfatal Recordable Incidents (Per 100 Full-Time Equivalent Workers)	Lost Workdays (Per 100 Full-Time Equivalent Workers)	Fatalities (Per 100,000 Full-Time Equivalent Workers)*
Construction	4.0	2.1	9.0
Utilities (electric power generation, transmission, control, and distribution)	3.1	1.7	2.5

Sources: BLS 2010a,b,c.

From 2003 to 2007, the most common causes of fatalities were transportation accidents (36 percent), followed by assaults and violent acts (15 percent) and falls (14 percent). Worker contact with electric current in some shape or form was responsible for 4 percent of fatal workplace accidents. Worker contact with overhead power lines was the cause of on-the-job electrical deaths in 45 percent of all occupational electrical fatalities (ESFI 2010).

The 2010 injury rate for the state of Utah was not statistically different from the national rate. Wyoming and Nevada had injury rates statistically greater than the rest of the country. State injury rates were not available for Colorado (BLS 2010a). Worker safety issues are a concern during all phases of the Project.

3.18.4 Electric and Magnetic Fields, Corona, and Stray Voltage

Electric and magnetic fields (EMF) are produced by voltage, i.e., the electrical pressure that drives an electric current through a circuit. Magnetic fields are produced by current, which is defined as the movement or flow of electricity. The earth has both magnetic fields produced by currents of highly conductive iron contained within the molten core of the planet and an electric field produced by the electric potential differences between the land's surface (negatively charged) and the atmosphere (positively charged). Electric fields occur naturally, radiating from the earth's core to the atmosphere. These electrical fields dissipate with elevation. For example, there is approximately a 200 volts difference between the electric field at your head compared to your feet (Carlson 1999). While electrical fields can be easily shielded or reduced by walls and other objects, magnetic fields are not and they are more likely to penetrate into the body.

EMFs are present wherever electricity is used, such as in household appliances, cell phones, wristwatches, lamps, computers, and transmission lines. The electric-field strength from wiring and appliances located within homes is typically less than 0.01-kV/m, while greater field strength can be found very close to some appliances, such as electric blankets. Typical homes produce background magnetic field levels (away from appliances and wiring) that range from 0.5 milliGaus (mG) to 4 mG, with an average value of 0.9 mG.

High voltage direct current (DC) and alternating current (AC) power lines produce different types of EMF. An AC power line alternates at a rate of 50 to 60 times a second (Hz), while a DC power line produces a static electric field that does not alternate. Static electric fields, such as those produced from DC power lines, are encountered naturally in the everyday environment such as when walking across carpet on a dry day (Bailey 2006). Static electric fields can be blocked by trees, bushes, and any conducting building material. There are no federal standards or standards from affected states limiting occupational or residential exposure to power line EMF; however, the International Committee on Non-ionizing Radiation Protection (ICNIRP) has set a voluntary protection level for electrical fields for the general public of 4.2-kV/m (ICNIRP 1998). The results of the few electric static studies that have been conducted indicate that the only effects are associated with body hair movement and discomfort from spark discharges (WHO 2006). The recommended maximum static magnetic field exposure value from the World Health Organization (WHO) is 200,000 mG during the working day for occupational exposure (WHO 2006). The natural magnetic field varies from 350 to 700 mG. Man-made devices that use DC, such as electric trains and some industrial use equipment, can be up to 1,000 times as strong as what is produced naturally. Medical devices such as MRIs can produce magnetic fields up to 100,000 times stronger than the naturally occurring magnetic field (TWE 2011). Both electric and magnetic fields diminish rapidly between 50 to 100 feet from the source and are insignificant at distances more than 100 feet (TWE 2011).

It has been suggested that a connection may exist between EMFs and various forms of cancer (WHO 2011). However, there have been mixed and often conflicting opinions regarding health effects related to EMF exposure. Human exposure to a 60-Hz magnetic field from alternating current produces a current density that is approximately 1,000 times less than naturally occurring currents (National Research Council [NRC] 1997). Additionally, human exposure to the magnetic field from high capacity

direct current power lines is the same or less than to the naturally occurring magnetic field (TWE 2011). While some studies have linked EMF to increased incidence of childhood leukemia, central nervous disorders, and adult cancers (including leukemia), the results have not been reproducible or conclusive (National Institute of Health [NIH] 1999, NIH 2005). The National Research Council evaluated the published literature on EMF and found a statistical relationship between residential wiring codes and an increased incidence of childhood leukemia, but there was no correlation between measured magnetic fields and incident rates of childhood leukemia (NRC 1997). Further, there is no known mechanism for EMF to cause disease (NRC 1997). Other studies have failed to indicate a correlation between exposure levels or exposure duration. There is no consistent or conclusive evidence linking exposure to EMF from electrical transmission lines to human disease (NRC 1997, NIH 2005).

Corona, a luminous electrical discharge on a transmission line, is caused by electric current arcing across two or more points along transmission line conductors. It can be seen as bluish tufts or streamers surrounding the conductor, and generally a hissing sound can be heard. Transmission line corona varies with atmospheric conditions, being more intense during wet weather. Corona on the surface of high voltage conductors can create signals that may interfere with radio and television reception, but can be minimized with modern transmission line design.

It has been hypothesized that corona creates ions that can be dispersed by winds, inhaled and deposited on the skin and in the lung, and lead to adverse human effects (Fews et al. 1999). The Independent Advisory Group on Non-ionizing Radiation (National Radiological Protection Board 2004) concluded that:

> *"…it seems unlikely that corona ions would have more than a small effect on the long-term health risks associated with particulate air pollutants, even in the individuals who are most affected. In public health terms, the proportionate impact will be even lower because only a small fraction of the general population live or work close to sources of corona ions."*

Subsequent reviews have reaffirmed the lack of correlation between exposure to EMF or corona ions and adverse health effects (WHO 2007; Energy Network Association 2009).

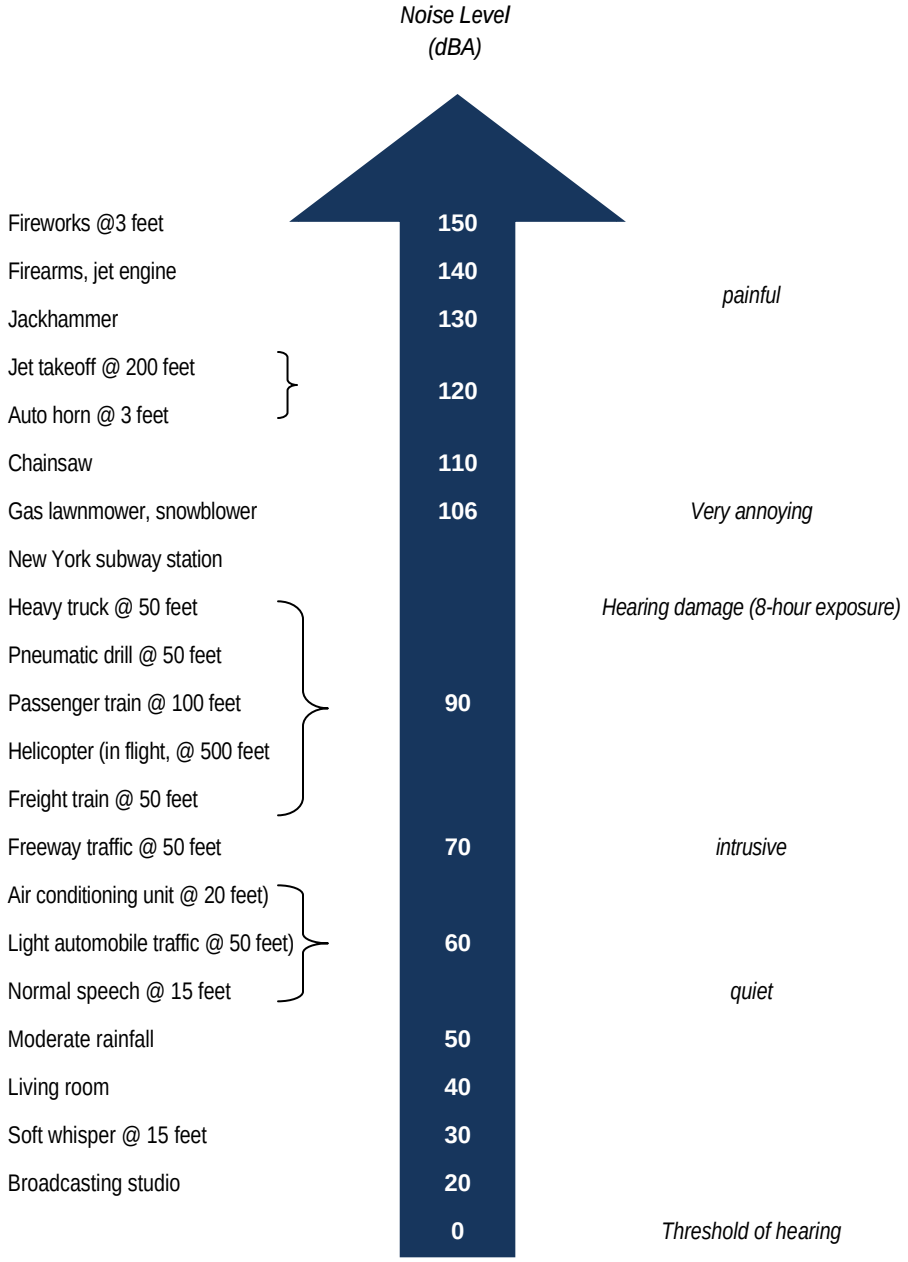
Stray voltage is typically associated with rural end-users, such as farm and ranch complexes where equipment is exposed to dust and other contaminants. Induced current occurs along linear features, such as fences that parallel conductors, and typically can be minimized with adequate grounding. As a result of their static nature, DC lines do not induce currents and voltages. In contrast, as a result of their alternating nature, AC electric fields can induce currents and voltages in nearby conductive objects.

3.18.5 Noise

Noise is defined as any sound that is undesired or interferes with one's hearing. Noise is considered a human health concern as it can interferes with speech communication and hearing or is otherwise considered annoying. The term "unwanted" can be subjective in nature and can vary greatly among individuals. An individual's response to noise is influenced by the type of noise, perceived importance of the noise, appropriateness in the setting, time of day, type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is measured in dBA and is based on a logarithmic scale to account for the wide range of audible sound intensities. Under the logarithmic scale for sound (and noise), a 10-dBA increase would increase sound intensity by 10 times; a 20-dBA increase would increase sound intensity by 100 times. As a result, methods have been developed for weighting the sound frequency spectrum to approximate the response of the human ear. The dBA scale uses a sound range of 0 to 140 dBA and is the most widely used weighted scale for environmental noise assessments because of its relative convenience and

accuracy in correlating with people's judgments of what constitutes noise. Typical A-weighted sound and noise levels associated with common activities or situations are shown in **Figure 3.18-1**.



Source: CEQ 1970.

Figure 3.18-1 Typical A-weighted Sound Levels

Ambient noise, or background noise, is defined as an assortment of noise from nearby and distant sources, relatively steady and homogeneous, with no particular source identifiable within it (National Wind Coordinating Committee 2002). Ambient noise levels within the Project corridor have not been measured; however, as rural background noise in wilderness and rural areas typically is 40 dBA (USEPA 1978), they are likely to be similar in magnitude. Levels near developed areas and along area roads and highways are likely to be higher due to vehicle movement and other human activities. Wind is frequently a major contributor to ambient noise levels within the area, as well as agricultural machinery

noise when operated near residences and other sensitive receptors. Sensitive receptors within the area are limited to residents in scattered rural locations as well as low population urban areas.

Noise level from a line source such as a power line will decrease by 6 dBA for every doubling of the distance away from the source (Truax 1999). This concept, known as geometric spreading, is based on the inverse square law. This law states that the intensity of the influence at any given radius is the source strength divided by the area of the sphere. The energy twice as far from the source is spread over four times the area, hence the sharp drop off in intensity. Sound intensity follows the inverse square law assuming there are no reflections or reverberations. **Table 3.18-2** displays the human perception of a change in decibel levels.

Table 3.18-2 Human Perception of Noise Level Changes

Change in Decibel Level	Result
1 dBA	Cannot be perceived
3 dBA	Barely discernible
5 dBA	Noticeable community response
10 dBA	Causes an adverse community response

As shown above, when comparing similar sounds (e.g., changes in traffic noise levels) a 3-dBA change in sound-pressure level is considered detectable by the human ear in most situations. A 5-dBA change is readily noticeable by most people, and a 10-dBA change is perceived to be a doubling (or halving) of sound or noise. Impacts to wildlife from noise are addressed in Section 3.7, Wildlife and Section 3.8, Special Status Wildlife Species.

3.18.6 Hazardous Materials and Waste

3.18.6.1 Hazardous Materials

A number of hazardous substances are used in the construction, operation, and maintenance of electrical transmission lines. **Table 3.18-3** lists common types of materials that could be used, but is not a comprehensive list. Generation of hazardous waste is not anticipated.

Table 3.18-3 Hazardous Materials Typically Used for Transmission Line Construction

2-cycle oil (contains distillates and hydrotreated heavy paraffinic)	Gasoline treatment
ABC fire extinguisher	Hot stick cleaner (cloth treated with polydimethylsiloxane)
Acetylene gas	Hydraulic fluid
Air tool oil	Insulating oil (inhibited, non-PCB)
Ammonium hydroxide	Lubricating grease
Antifreeze (ethylene glycol)	Mastic coating
Automatic transmission fluid	Methyl alcohol
Battery acid (in vehicles and in the meter house of the substations)	Motor oils
Bottled oxygen	Paint thinner
Brake fluid	Pesticide
Canned spray paint	Propane

Table 3.18-3 Hazardous Materials Typically Used for Transmission Line Construction

Chain lubricant (contains methylene chloride)	Puncture seal tire inflator
Connector grease (penotox)	Safety fuses
Contact Cleaner 2000	Starter fluid
Diesel deicer	Sulfur hexaflouride (within the circuit breakers in the substations)
Diesel fuel	1,1,1 trichloroethene
Diesel fuel additive	WD-40 (penetrating oil)
Gasoline	

Source: San Diego Gas and Electric (SDGE) 2006.

3.18.6.2 Solid Waste

Solid waste generated from transmission line construction is minimal when compared to other types of industrial and commercial construction projects. Solid waste generated from construction and operation of the proposed transmission line and substations would generally consist of construction rubble (e.g., excess or off-spec concrete, soil, and rock), paper, cardboard, and packing material, brush, other vegetation, and scrap metal (SDGE 2006).

3.18.6.3 Existing Contaminated Sites

Exposure to certain chemicals can adversely affect human health through toxic reactions, carcinogenic effects, or both. Chemical exposure can occur from chemicals present in water or in soil from past industrial activities. Contaminated sites can result from industrial activities (mineral extraction, mineral processing, and manufacturing) or from commercial activities (fuel storage for retail outlets, vehicle maintenance). Active or closed landfills or unauthorized dumps also may present potential for exposure.

There are no known contaminated sites along the proposed route; however, despite the predominantly rural landscapes crossed by the proposed Project, contaminated sites may be encountered or discovered during construction, given that the proposed routes often parallel- or are within- existing utility and transportation corridors or are in areas with current or historic oil and gas production. No Phase I Environmental Site Assessments have been conducted for the proposed route.

3.18.7 Impacts to Public Health and Safety, Hazardous Materials

The impact analysis area for public health and safety is defined as the area within the 2-mile transmission line corridor of any of the alternative routes. Potential impacts associated with public health and safety, such as construction injuries to project personnel, electric and magnetic fields (EMF), corona effects, stray and induced voltage, noise, and hazardous materials are evaluated for the impact analysis area.

The methodology for evaluating impacts on public health and safety involves identifying and assessing design, construction, and operational standards and guidelines for electric transmission lines; determining the proximity of populated areas and structures to the proposed project; and calculating the proximity of communication sites and co-located pipelines to the analysis area. Communication sites were analyzed in order to assess the probability of communication disturbances caused by corona. The potential effects of EMF from AC power lines on co-located pipelines are discussed in Section 3.18.7.2.

The following impact parameters have been used for this analysis:

- Number of communities, sensitive receptors, and recreation areas within the 2-mile transmission line corridor area.
- Number of residences, commercial/industrial buildings, agricultural buildings, and outbuildings within 500 feet and 200 feet of the reference line.
- Number of non-project related communication sites within the 2-mile transmission line corridor analysis area. Communication sites may include, but are not limited to, AM, FM, cellular, television, and microwave sites.
- Potential for accidental release of hazardous materials during construction and operation.

Impact parameters were used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among alternatives or alternative variations. Impact issues and the analysis considerations for public health and safety are listed in **Table 3.18-4**.

Table 3.18-4 Relevant Analysis Considerations for Public Health and Safety, Hazardous Materials

Resource Topic	Analysis Considerations and Relevant Assumptions
Serious injuries to workers and the public at-large.	The analysis evaluates potential construction and operation impacts to the health and safety of workers.
Adverse health impacts from EMF, stray voltage, and induced voltage associated with transmission lines.	The analysis evaluates direct effects on communities and sensitive receptors from potential adverse impacts from electric transmission.
Noise impacts to nearby communities and residences.	The analysis evaluates the potential for noise impacts on nearby communities, residences, and other noise sensitive receptors.
Impacts from accidental release of hazardous materials.	The analysis evaluates potential impacts from the accidental release of hazardous materials.

3.18.7.1 Impacts from Terminal Construction and Operation

The northern and southern terminals would be constructed regardless of alternative route or design option.

Northern Terminal

The Northern Terminal would be sited on private lands near Sinclair, Wyoming and would require an initial disturbance of 504 acres for construction and a permanent disturbance of 234 acres for operation.

There are no residences, communities, parks or developed recreation areas within 1 mile of the proposed terminal site. There is a federal prison located more than 2 miles from the terminal site. There are no other sensitive receptors located within 1 mile of the terminal site. There are no structures within 500 feet of the terminal site. The lack of sensitive receptors and structures near the terminal site would result in no impacts from noise and EMF. The lack of communication sites near the terminal area also would result in no impacts to emergency communications. Further analysis is provided in the subsections below.

Occupational Safety

During construction of the Northern terminal, workers would be at risk of injury from use of heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical

hazards found on a construction site. Based on BLS data from 2010, there are four construction-related non-fatal recordable incidents per 100 full-time equivalent workers. Based on an average construction workforce of approximately 400 workers, it is estimated there would be 16 non-fatal recordable incidents. In order to minimize hazards to construction workers that may result in injuries that meet or exceed the BLS threshold, workers would follow the National Electrical Safety Code (NESC), U.S. Department of Labor requirements, and Occupational Safety Health Administration (OSHA) safety standards, as well as project-specific safety requirements (TWE-51). A health and safety plan also would be implemented to protect workers and the public during construction (TWE-56).

Through the implementation of TWE-51 and TWE-56, as well as adherence to the NESC, U.S. Department of Labor requirements, and OSHA safety standards, minimal to no impacts to worker safety are anticipated from terminal construction.

During operations, there would be risk for injuries to maintenance and contract workers. To minimize risk, safety measures would be taken that include following the NESC, U.S. Department of Labor requirements, and OSHA safety standards, as well as providing appropriate training to all pertinent personnel. To reduce the risk of fire, fire protection staff would be located at the terminal. Safety and security lighting, as well as security fencing, would be installed as well. Security staff would consist of support operations and maintenance workers located at the terminal.

Through adherence to the NESC, U.S. Department of Labor requirements, and OSHA safety standards, as well as the installation of security lighting and fencing, minimal to no impacts to worker safety are anticipated from terminal operations.

Fire Risk

To minimize the incidence of injuries due to fire during construction and operation, a Fire Protection Plan would be implemented (TWE-64). Components of this plan include, but are not limited to, work vehicles would carry shovels, water, and fire extinguishers, operating all vehicles on designated roads, parking in areas free of vegetation, and operating welding, grinding, or cutting activities in areas cleared of vegetation.

Through the implementation of TWE-64, impacts to public health and safety as a result of fire are not expected.

Noise

Other health effects to construction workers and the public in the vicinity of the terminal area would include increased noise levels from heavy construction machinery and construction activities, as well as light vehicle construction traffic. Average noise levels for typical construction equipment range from 74 dBA for a roller to 88 dBA for a crane (Harris, Miller, Miller, and Hanson, Inc. [HMMH) 2006). In general, the dominant noise source from most construction equipment is the diesel engine, particularly if the engine is poorly muffled. Other sources of continuous noise include field compressors, bulldozers, and backhoes. **Table 3.18-5** portrays the noise levels of various types of construction equipment expected at different distances.

Table 3.18-5 Noise Levels at Various Distances from Typical Construction Equipment

	Noise Level[1] at Distances (dBA)					
Construction Equipment	**50 feet**	**100 feet**	**200 feet**	**400 feet**	**800 feet**	**1,600 feet**
Bulldozer	85	79	73	67	61	55
Concrete Mixer	85	79	73	67	61	55
Concrete Pump	82	76	70	64	58	52

Table 3.18-5 Noise Levels at Various Distances from Typical Construction Equipment

	Noise Level[1] at Distances (dBA)					
Construction Equipment	**50 feet**	**100 feet**	**200 feet**	**400 feet**	**800 feet**	**1,600 feet**
Crane, Derrick	88	82	76	70	64	58
Crane, Mobile	83	77	71	65	59	53
Front-end Loader	85	79	73	67	61	55
Generator	81	75	69	63	57	51
Grader	85	79	73	67	61	55
Shovel	82	76	70	64	58	52
Truck	88	82	76	70	64	58

[1] The equivalent steady-state sound level that contains the same varying sound level during a 1-hour period.

Source: HMMH 2006.

For a general assessment of construction impacts, assuming a geometric spreading only (i.e., a decrease of about 6 dBA per doubling of distance from a point source) on the basis of the noise levels presented in **Table 3.18-5**, it is estimated that the noisiest piece of equipment operating at peak load would produce noise levels that would exceed the USEPA guideline for residential noise (55 dBA) at a distance of about 1,600 feet (USEPA 1974). Rural background noise in wilderness and rural areas is typically near 40 dBA (USEPA 1978). The effects of noise generated by construction would be alleviated, to some extent, by air absorption, terrain, and vegetation.

BMPs to reduce the impacts of noise are: NOISE-1 (limit noisy construction activities [including blasting] to the least noise-sensitive times of day [i.e., daytime only between 7 a.m. and 10 p.m.]) and NOISE-2 (ensure that all equipment has sound-control devices no less effective than those provided on the original equipment). Also, a Blasting Plan, which would identify methods and measures to minimize the effects of blasting, would be implemented (TWE-53). While noise levels at 55 dBA would be approximately 15 dBA higher than the ambient rural noise level, this would not be a permanent increase, but an impact that would end once construction ceases (approximately 2.5 years project-wide, but much shorter in localized areas).

Potential power line noise during the operation phase can result from corona discharge, which is the electrical breakdown of air into charged particles. While hardly audible at the edge of the ROW in dry weather, in humid wet conditions, water drops collecting on the lines provide favorable conditions for corona discharges. During a rainfall event, noise from corona discharge emanating from a power line would be at 39 dBA, at approximately 50 feet from the center of the tower. This would equal the noise being generated in a library (BPA 1996). In general, because of the arid climate in the analysis area and existing ambient noise, such as wind and wildlife, the impact of corona noise is expected to be negligible. Noise from traffic during the operations phase would range from light- to medium-duty vehicles, and is expected to be negligible. Overall, the noise levels of operations would be lower than the noise levels associated with short-term construction activities, and in conjunction with the existing ambient noise, would result in a negligible impact to noise sensitive receptors in the analysis area.

As a result of the potential risk of noise exceeding USEPA guidelines during construction, the mitigation measure below is recommended in addition to the proposed design features and BMPs.

***PH -1**: Develop, implement, and maintain a noise complaint reporting and review process to deal with potential queries and issues as they arise. This would include a toll-free telephone number for receiving*

question or complaints during Project construction and a public liaison person before and during Project construction to respond to concerns over noise.

By notifying sensitive receptors in advance, an opportunity is given to leave the area during construction activities or to prepare for construction-related noise; however, residences beyond 300 feet of construction activities who would not be notified would still be within the range elevated levels of construction noise, without the benefit of advance notice.

Only minor impacts to noise sensitive receptors due to construction are anticipated as a result of the implementation of the TWE-53, BMPs NOISE-1 and NOISE-2, the proposed mitigation measure **PH-1**, and the remote and rural project location.

EMF, Corona, Stray and Induced Voltage

Impacts from EMF, corona, and stray and induced voltage during operations are expected to be minimal due to the lack of communities, areas of public gathering, and recreation sites within 1 mile of the Northern terminal areas. Regular monitoring required by TWE-54 would minimize EMF and noise effects. Furthermore, necessary mitigation would be applied to eliminate effects related to induced currents and voltages on conductive objects sharing the 250-foot-wide transmission line ROW (TWE-52). Implementation of TWE-49 and TWE-50 would reduce corona effects and noise. Design specifications include the use of materials designed to minimize radio and TV interference due to corona, as well as the use of regular surveillance patrols to identify and quickly repair any damaged insulators that may cause corona. In areas within the terminal where the AC transmission system could cause shock by electrostatic and electromagnetic AC induction, all buildings, fences, and other structures with metal surfaces located within 300 feet of the centerline would be grounded. All metal irrigation systems and fences that parallel the AC transmission line for distances of 500 feet or more and are within 300 feet of the centerline would be grounded. Additionally, all fences that cross under the AC transmission line also would be grounded (**Appendix D**).

Minimal to no impacts to public health are anticipated from EMF, corona, or stray and induced voltage due to the implementation of TWE-49, TWE-50, TWE-52, and TWE-54, which are the measures indicated in the PDTR (**Appendix D**), as well as the remote nature of the terminal area and the lack of sensitive receptors and land uses such as communication sites, residences, and hospitals.

Hazardous Materials

Impacts related to the presence of hazardous materials could result with an accidental release of hazardous materials from transportation and use during construction. These impacts are often the result of improper handling or storage of hazardous materials. The environmental effects of a release would depend on the material released and the location of the release. Potential releases could include a small amount of fuel spilled during a transfer operation at the right-of-way to the loss of several thousand gallons of fuel into a riparian drainage. Impacts from spills would typically be minor because of the low frequency of spill occurrence, relatively low volume of materials being handled, and the small volume of spills. As part of the COM Plan, the applicant would prepare and provide a Spill Prevention Notification and Cleanup Plan (TWE-57). The Plan would include spill prevention measures, notification procedures and employee awareness training to reduce the potential of hazardous materials releases or spills.

Impacts associated with the release or spill of hazardous materials to the environment or people during construction are expected to be minimal with the implementation of TWE-57.

During construction, contaminated soil and/or groundwater (e.g. hydrocarbon contamination) could be encountered. Work would be suspended in the area of suspected contamination until the type and extent of the contamination is determined. The specific procedures for handling the discovery of potentially contaminated soils would be described in the Hazardous Materials Management Plan as part

of the COM Plan (TWE-61). The Applicant and appropriate environmental agencies would be contacted as required by law (TWE-62).

If unanticipated contaminated soil or groundwater is encountered during construction, procedures described in the Hazardous Materials Management Plan would be implemented (TWE-61) and the proper authorities notified (TWE-62).

Southern Terminal

The two options for the southern terminal would be sited near Boulder City, Nevada, and would require an initial disturbance of 412 acres for construction and a permanent disturbance of 203 acres for operation.

There are no communication sites, residences, structures, communities or parks or developed recreation areas within 1 mile of the proposed terminal sites, nor are there sensitive receptors located within 1 mile of the terminal sites. The lack of sensitive receptors near the terminal sites would result in no impacts from noise and EMF.

During construction of the Southern terminal, workers would be at risk of injury from use of heavy equipment, working at heights, working in the vicinity of high voltage equipment, as well as from typical hazards found on a construction site. Based on BLS data from 2010, there are four construction-related non-fatal recordable incidents per 100 full-time equivalent workers. Based on an average construction workforce of approximately 500 workers, it is estimated there would be 20 non-fatal recordable incidents. In order to minimize hazards to construction workers that may result in injuries that meet or exceed the BLS threshold, workers would follow the NESC, U.S. Department of Labor requirements, and OSHA safety standards, as well as project-specific safety requirements (TWE-51). A health and safety plan also would be implemented to protect workers and the public during construction (TWE-56).

The same BMPs and design features used for the Northern Terminal would be implemented for construction and operation of the Southern Terminal, resulting in similar impacts to public health and safety.

The implementation of TWE-51, TWE-56, and TWE-64 and adherence to NESC, U.S. Department of Labor requirements, and OSHA safety standards would reduce or eliminate the risk of serious injuries. Only minor construction related impacts are anticipated due to the implementation of the TWE-53, BMPs NOISE-1 and NOISE-2, and the proposed mitigation measure **PH-1**. Minimal to no impacts to public health are anticipated from EMF, corona, or stray and induced voltage due to the implementation of TWE-49, TWE-50, TWE-52, and TWE-54, the measures indicated in the PDTR (**Appendix D**), and the lack of sensitive receptors, residences, and hospitals. Impacts associated with the release or spill of hazardous materials to the environment or people during construction or discovery of contaminated soil or groundwater are expected to be minimal with the implementation of TWE-57 and TWE-62.

3.18.7.2 Impacts Common to all Alternative Routes and Associated Components

Potential effects of construction, operation, and decommissioning on public health and safety are discussed below for each of the resource issues listed in **Table 3.18-4**. After potential impacts are identified, relevant agency BMPs and design features are discussed in terms of reducing impacts. If impacts remain after application of BMPs and design features, additional mitigation is recommended to reduce impacts.

Construction Impacts

The same BMPs and design features used during terminal construction to reduce risk of occupational injury, impacts from fire, noise or hazardous materials would be implemented for construction and

operation of the alternative routes and associated components, resulting in similar impacts to public health and safety.

The implementation of TWE-51, TWE-56, and TWE-64 would reduce or eliminate the risk of serious injuries. Only minor construction related impacts to noise sensitive receptors are anticipated as a result of the implementation of TWE-53, BMPs NOISE-1 and NOISE-2, and the proposed mitigation measure **PH-1**. Impacts associated with the release or spill of hazardous materials to the environment or people during construction or discovery of contaminated soil or groundwater are expected to be minimal with the implementation of TWE- 57 and TWE-62.

Operation Impacts

The effects of operation of the Project would involve potential EMF impacts on residences, sensitive receptors, nearby communities, recreation areas, lightning, corona effect on communication sites, stray and induced voltage, noise, fire, and the health and safety of maintenance workers. Most of the impacts associated with operation activities would be separate and unique from the types of effects discussed for construction activities.

Electrocution

The transmission lines would be operated according to the NESC and are designed to minimize the risk for shock (TWE-51). Therefore, the risk of electrocution during operation would be negligible. The shock a human or animal would receive by touching a metal object near a transmission line would be similar to that received after walking across carpet. Only maintenance and contract workers would be expected to be near the transmission lines. The public would be directly exposed to transmission lines if the lines were cut or otherwise downed, in which case, the lines are designed to trip out of service (turn off). Transmission lines would be monitored and maintained so the likelihood of this event is minimized.

Lightning

Potential adverse health effects associated with lightning strikes would be minimized by the presence of the overhead ground wire and optical ground wire that shield the conductors. The current from a lightning strike is diverted to the ground at the adjacent structure. When the current is discharged from the structure base to the surrounding ground, a step potential voltage can momentarily exist on the ground near the structure, presenting an electrocution hazard. Therefore, workers and the public should avoid structures during a lightning storm.

Through the implementation of the TWE-51, impacts to public health and safety from electrocution and lightning during operations would not be expected.

EMF, Corona Noise, and Stray Voltage

High voltage DC transmission lines, as opposed to high voltage AC transmission lines, produce a constant static electric and magnetic field that decrease rapidly from the transmission line source. The natural geomagnetic field varies from 350 to 700 mG. Man-made devices that use DC, such as electric trains and some industrial use equipment, can produce a magnetic field up to 1,000 times as strong as what is produced naturally. Medical devices such as MRIs can produce magnetic fields up to 100,000 times stronger than the naturally occurring magnetic field. The estimated magnetic field strength directly beneath a 600 kV DC transmission line when at full capacity is expected to be approximately 875 mG, and 425 mG when at half capacity, averaging about the same as recorded naturally on the earth's surface. The strength of the field decreases rapidly with distance. The average magnetic field drops to 150 mG when 200 feet from the centerline, and 100 mG when 300 feet from the centerline (TWE 2011).

The recommended maximum static magnetic field exposure value from the World Health Organization (WHO) is 200,000 mG during the working day for occupational exposure. Exposure from the proposed Project would be considerably less than the WHO recommendation, equaling the same exposure level

as what occurs naturally. It also is much less than the recommended exposure level (5,000 mG) for cardiac pacemakers and other implanted electronic devices (WHO 2006). The nominal static electric field produced directly underneath a 600 kV line is less than 20 kV/m. This drops to less than 5 kV/m at 100 feet from the centerline (TWE 2011). The results of the few electric static studies that have been conducted indicate that the only effects are associated with body hair movement and discomfort from spark discharges (WHO 2006). The magnetic field of a DC transmission line, unlike an AC transmission line, does not affect paralleling objects such as pipelines (Bailey et al. 1996).

Transmission lines would be designed to minimize electric and magnetic fields. The practice of prudent avoidance is based on limiting exposure to electric and magnetic fields, to the extent practical. Using this approach, transmission lines would not be routed in proximity to residential structures, schools, or other sensitive facilities to the extent practical. TWE-54 would be implemented to minimize EMF and noise effects from operating the transmission lines. As a result of the low level of static electric and magnetic fields that would be produced under and near the proposed transmission line, and the applicant's commitment to route away from sensitive land uses when practical, impacts from EMF would be reduced or non-existent.

Stray voltage and induced current are not produced by the type of EMF from DC transmission lines; however, necessary mitigation would be applied to eliminate effects related to induced currents and voltages on conductive objects sharing the 250-foot-wide transmission line ROW (TWE-52).

Corona on the surface of high voltage conductors can create signals that may interfere with radio and television reception. Modern transmission line design has reduced corona to a minimum and such design is proposed for the proposed Project. Occasionally, more sensitive radio and television sets pick up on "corona noise." Problems would be addressed on a case-by-case basis. Although corona can cause television and radio reception interference, it does not represent a threat to human health or safety. TWE-49 and TWE-50 would be implemented to reduce the effects of corona and noise. These design features include the use of materials designed to minimize audible noise and radio and TV interference due to corona, as well as the use of regular patrols so that damaged insulators, which may cause corona would be quickly repaired. It is anticipated that the implementation of these design features would prevent disruption of emergency communications.

Under Design Option 2, in addition to the proposed TWE Project, a 500-kV AC transmission line would be constructed approximately 350 miles in length, between the new AC/DC converter station in Utah to one of the existing substations in Eldorado Valley, south of Boulder City, Nevada (Marketplace Hub). The 500-kV AC portion of this design option would transect Regions III and IV. Design Option 3 also would utilize AC transmission. Under Design Option 3, Phase I, AC transmission lines would be constructed instead of DC transmission lines. Under Phase 2, AC transmission lines would be converted to DC.

As discussed in Section 3.18.4, EMF from an AC line differs from a DC line in that electric and magnetic fields are oscillating and not static. The electric field measurements at 300 and 125 feet from the centerline of a 500 kV power line during peak usage would both be less than 1.0 kV/M (SDGE 2006). This is well below the voluntary threshold of 4.2-kV/m established by the ICNIRP. The anticipated magnetic field measurements at 300 and 135 feet from the centerline during peak usage would equal approximately 3 mG and 25 mG, respectively, slightly more than a fluorescent light and a can opener at 2 feet (EM Watch 2011). Both electric and magnetic fields drop considerably as distance increases from the centerline. Based on predicted estimates, magnetic and electric fields are expected to diminish rapidly between 50 to 100 feet from the centerline and are insignificant more than 100 feet from the edge of the 250-foot-wide transmission line ROW (TWE 2011).

Unlike DC transmission lines, AC transmission lines can cause induced current in nearby objects. Induced current occurs along linear features, such as fences that parallel conductors, and can typically be minimized with adequate grounding. In order to minimize the potential for electric shock, buildings,

fences, and other structures with metal surfaces located within 300 feet of the centerline would be grounded. All metal irrigation systems and fences that parallel the AC transmission line for distances of 500 feet or more and are within 300 feet of the centerline would be grounded. Additionally, all fences that cross under the AC transmission line also would be grounded (PDTR, **Appendix D**).

Approximately 55 percent of this design option from IPP to Marketplace Hub that would be constructed using AC power lines is co-located with existing utility corridors that may contain pipelines. When a high voltage AC transmission line is located adjacent to a pipeline ROW, the pipeline may be subject to electrical interference from electric and magnetic induction. This form of interference is due to the magnetic field produced by the AC current flowing in the conductors of the transmission line coupling with the metallic pipeline, inducing voltage and associated current on the pipeline. In order to minimize the potential for this interference, measures include reducing the impedance of the transmission structure grounds, grounding the pipeline in conjunction with de-couplers, burying gradient control wires along the pipeline, and using dead fronts at test stations. In locations where the final alignment of an AC section of transmission is in close proximity to a pipeline, computer modeling of AC interference effects would be completed and any required mitigation would be designed and installed prior to energizing the transmission line. Similarly, when a high voltage AC transmission line is located adjacent to a railroad, electric and magnetic induction results from the magnetic field and may result in personal safety hazards, damage to signal and communication equipment, and false signaling of equipment. Specifications from the American Railway Engineering and Maintenance-of-Way Association would be followed to ensure safety of railway operating personnel and the public. In addition, railroad signal and equipment manufacturers provide AC interference voltage tolerances for proper signal operation so that nearby transmission facilities can be designed to ensure AC interference levels do not exceed the acceptable safety criteria (**Appendix D**).

Impacts to public health and safety from construction, operation, and decommissioning would be the same as discussed in Section 3.18.7.1, Impacts from Terminal Construction, Operation, and Decommissioning, and Section 3.18.7.2, Impacts Common to All Alternative Routes and Associated Components. Impacts related to DC effects also would be the same as discussed in Section 3.18.7.2. Impacts would differ from previous analysis at the ground electrode bed system in Region III. The siting of the proposed ground electrode bed system for Design Option 2 Region III is located within an area that has not previously been analyzed in this section. There is a recreation area (Little Sahara Recreation Area) and a wildlife study area (Fish Springs) within 1 mile of the proposed ground electrode bed system. There would be no communities or communication sites within a mile of the proposed location. There are no structures within 500 feet of the reference line. The terminal location for Design Option 2 would be sited near IPP and would require an initial disturbance of 181 acres for construction and a permanent disturbance of 118 acres for operation. There are no communication sites, residences, communities, parks, developed recreation areas, or other sensitive receptors within 1 mile of the proposed terminal site. The lack of sensitive receptors near the terminal site would result in no impacts from noise and EMF. Impacts from construction would be similar to those detailed for the Southern and Northern Terminals.

Impacts to public health and safety would be the same as discussed in Section 3.18.7.1, Impacts from Terminal Construction, Operation, and Decommissioning, and Section 3.18.7.2, Impacts Common to All Alternative Routes and Associated Components. Impacts as a result of the AC portion of the design option would be the same as Design Option 1. The Phase 1 AC portion of this design option would transect Regions I and II, but would be converted to DC under Phase 2.

Through the implementation of TWE-49, TWE-50, TWE-52, and TWE-54, as well as the mostly remote location of the proposed project and the limited number of sensitive receptors adjacent to the reference line, minimal to no impacts to public health are anticipated from EMF, corona, stray voltage, or induced current.

Occupational Safety

During operations, there would be a slight risk for injuries to maintenance workers who travel in the 250-foot-wide transmission line ROW to perform maintenance on the transmission lines. To minimize risk, safety measures would be taken that include enforcing red flag warnings, providing appropriate training to all pertinent personnel, keeping vehicles on or within designated roads or work areas, and adherence to NESC, U.S. Department of Labor requirements, and OSHA safety standards. Additionally, to reduce the risk to maintenance workers and the public from herbicide application, herbicides would be applied according to label instructions and within recommended rates. As noted, in Section 3.5, Vegetation, mitigation measure NX-3 would be implemented to ensure herbicide application would follow all applicable state and federal laws.

Through the implementation of proposed safety measures, such as enforcing red flag warnings, providing appropriate training to personnel, and adherence to national safety standards, negligible to no impacts from routine maintenance activities are anticipated.

Fire

To minimize the occurrence of fire from the power line, safety measures would be taken that include brush-clearing within the corridor prior to work, enforcing red flag warnings, providing appropriate training to all pertinent personnel, and keeping vehicles on or within designated roads or work areas. To minimize the impacts of fire during operations, a Fire Protection Plan would be implemented (TWE-64). Additionally, in the event the lines were cut or otherwise downed, the lines are designed to trip out of service (turn off), reducing the chances of fire.

Through the implementation of proposed safety measures, such as implementation of TWE-64, brush-clearing within the corridor prior to work, enforcing red flag warnings, providing appropriate training to all pertinent personnel, keeping vehicles on or within designated roads or work areas, as well as modern transmission line design, negligible to no impacts from fire are anticipated.

Hazardous Materials

Table 3.18-3 lists the various hazardous materials that would be used in the operation of the transmission line and associated facilities. The procedures for safe handling of these materials would be covered in the Spill Prevention Notification and Cleanup Plan (TWE-57) and is covered by a number of regulatory programs as described in Section 3.18.1, Regulatory Framework.

Impacts associated with the release or spill of hazardous materials to the environment or people during operations are expected to be minimal with the implementation of TWE-57.

Intentional Destructive Acts

The proposed transmission lines, terminals and other associated facilities could be targets of intentional destructive acts, including sabotage or terrorism. More common, intentional acts of destruction would include vandalism or theft. Acts of vandalism and theft are more likely to occur than acts of sabotage and terrorism and are most likely to occur at remote areas and at substations. Theft frequently involves equipment and salvageable metal at substations and switchyards. Vandalism often includes shooting out insulators. Sabotage and terrorism would most likely include destruction of key transmission line components with the intent of interrupting the electrical grid. Impacts from intentional destructive acts could range from no noticeable effect on electrical service to a disruption of service. Cameras, and signs and regular inspections of the 250-foot-wide transmission line ROW and facilities by operations personnel would be used as needed to prevent theft, vandalism, and unauthorized access. Additionally, safety and security lighting, as well as security fencing, would be installed at each terminal, substation, and series compensation station. Security staff would consist of support operations and maintenance workers. Reponses to intentional destructive acts would be implemented in accordance with the Proponents' emergency response plan.

Impacts associated with intentional destructive acts are expected to be minimal with the implementation of regular ROW monitoring, cameras, signage, and fencing, as well as the Proponents' emergency response plan.

Decommissioning Impacts

Health and safety impacts for this phase of the Project would be reduced in frequency compared to the construction phase, due to the shorter time period**.** The same BMPs and design features used in construction would be applied to reduce impacts during decommissioning activities.

3.18.7.3 Region I

Table 3.18-6 provides a tabulation of impacts associated with the alternative routes in Region I.

Table 3.18-6 Summary of Region I Alternative Route Impacts for Public Health and Safety, Hazardous Materials

Parameter		Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Communities		0	0	1	0
Parks or developed/dispersed recreation areas (campgrounds, etc)		0	0	0	0
Other Sensitive Receptors (schools and daycare centers; health care facilities such as hospitals or retirement and nursing homes; cemeteries; churches)		0	0	0	0
Communication Sites		12	13	17	9
Structures Within 500 feet of the Reference Line	Residential	0	0	9	0
	Commercial/Industrial	45	47	24	39
	Agricultural	0	0	0	0
	Outbuilding	3	7	11	3
Structures Within 200 feet of the Reference Line	Residential	0	0	0	0
	Commercial/Industrial	11	9	4	9
	Agricultural	0	0	0	0
	Outbuilding	3	3	4	3

Alternative I-A (Applicant Proposed)

Alternative I-A would cross 12 communication sites within the 2-mile transmission line corridor in Region I. There are 45 commercial/industrial structures and 3 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 11 commercial/industrial structures, but stays the same with 3 outbuildings within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. There would be no recreation areas, communities or sensitive receptors within the 2-mile transmission line corridor. Alternative I-A contains the most commercial/industrial buildings within 200 feet of the reference line. Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2, AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative I-B

Alternative I-B would cross 13 communication sites within the 2-mile transmission line corridor in Region I. There are 47 commercial/industrial structures and 7 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 9 commercial/industrial structures and 3 outbuildings within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. There are no recreation areas, communities, or sensitive receptors within the 2-mile transmission line corridor. Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2, AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative I-C

Alternative I-C would cross 17 communication sites and 1 community within the 2-mile transmission line corridor in Region I. The community within the corridor is Craig, located 0.3 mile from the reference line. The portion of Craig located near the reference line is the Craig South Highlands subdivision. Juniper Hot Springs in Colorado, is located 1 mile from the reference line, but is a resort, not a community. The 2010 census population for Craig was 9,964. There are 9 residential structures, 24 commercial/industrial structures, and 11 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 4 commercial/industrial structures and 4 outbuildings within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. There are no dispersed camping recreation areas within the 2-mile transmission line corridor. Alternative I-C contains the most communication sites and communities within the 2-mile transmission line corridor, but also the fewest structures within 200 feet of the reference line. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to significantly affect public health and safety.

Alternative I-D (Agency Preferred)

Alternative I-D would cross 9 communication sites within the 2-mile transmission line corridor in Region I. There are 39 commercial/industrial structures and 3 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 9 commercial/industrial structures and 3 outbuildings within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. There would be no recreation areas, communities or sensitive receptors within the 2-mile transmission line corridor. Under Design Option 3, Phase 1, AC transmission lines would be constructed. The Tuttle Easement micro-siting options would not substantially affect the impact analysis for public health and safety. Under Phase 2, AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative Connectors in Region I

Table 3.18-7 summarizes impacts associated with the alternative connectors in Region I.

Alternative Ground Electrode Systems in Region I

Table 3.18-8 provides a comparison of alternative electrode facility locations proposed within 10 to 100 miles of the Northern Terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Table 3.18-7 Summary of Region I Alternative Connector Impacts for Public Health and Safety, Hazardous Materials

Alternative Connector	Analysis
Mexican Flats Alternative Connector	There are no communities, sensitive receptors, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.
Baggs Alternative Connector	There are no communities, sensitive receptors, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.
Fivemile Point North Alternative Connector	There are no communities, sensitive receptors, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.
Fivemile Point South Alternative Connector	There are no communities, sensitive receptors, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.

Table 3.18-8 Summary of Region I Alternative Ground Electrode System Location Impacts for Public Health and Safety, Hazardous Materials

Alternative Ground Electrode System Locations	Analysis
Separation Flat (All Alternatives)	There are no communities, sensitive receptors, recreation sites, or communication sites within 1 mile of the proposed ground electrode system location or its associated transmission line. There are no structures within 500 feet of the reference line.
Shell Creek (Alternatives I-A, I-B, and I-D)	There are no communities, sensitive receptors, recreation sites, or communication sites located within 1 mile of the proposed ground electrode system location or its associated transmission line. There are no structures within 500 feet of the reference line.
Little Snake East (Alternatives I-A, I-B, and I-D)	There are no communities, recreation sites, or communication sites located within 1 mile of the proposed ground electrode system location or its associated transmission line. There is one residential structure 350 feet from the edge of the siting area and slightly over 1 mile from the edge of the site. There are no structures within 500 feet of the reference line.
Little Snake West (Alternatives I-A, I-B, and I-D)	There are no communities, sensitive receptors, recreation sites, or communication sites located within 1 mile of the proposed ground electrode system location or its associated transmission line. There are no structures within 500 feet of the reference line.
Shell Creek (Alternatives I-A, I-B, and I-D)	There are no communities, recreation sites, or communication sites located within 1 mile of the proposed ground electrode system location or its associated transmission line. There is one residential structure within the site area, but over 4 miles from the site location. There are no structures within 500 feet of the reference line.
Little Snake West (Alternatives I-A, I-B, and I-D)	There are no communities, sensitive receptors, recreation sites, or communication sites located within 1 mile of the proposed ground electrode system location or its associated transmission line. There are no structures within 500 feet of the reference line.
Eight Mile Basin (All Alternatives)	There are no communities, sensitive receptors, recreation sites, or communication sits located within 1 mile of the proposed ground electrode system location or its associated transmission line. There are no structures within 500 feet of the reference line.

Region I Conclusion

Alternative I-A, Alternative I-B, Alternative I-C, and Alternative I-D (Agency Preferred) would have similar impacts on public health and safety, with the exception that, as detailed in **Table 3.18-6**, Alternative I-C would affect a greater number of communities and residential structures than the remaining alternatives. This would increase the potential project construction and operation health and safety risk to residential

occupants. However, the successful implementation of design features, BMPs, and mitigation **PH-1**, would result in all of the alternatives having a relatively low impact on public health and safety.

3.18.7.4 Region II

Table 3.18-9 provides a tabulation of impacts associated with the alternative routes in Region II.

Table 3.18-9 Summary of Region II Alternative Route Impacts for Public Health and Safety, Hazardous Materials

Parameter		Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Communities		9	11	11	11	16	10
Parks or developed and dispersed recreation areas (campgrounds, etc)		18	4	3	6	15	6
Other Sensitive Receptors (schools and daycare centers; health care facilities such as hospitals or retirement and nursing homes; cemeteries; churches)		3	2	2	5	6	3
Communication Sites		38	91	138	84	77	99
Structures Within 500 feet of the Reference Line	Residential	53	5	4	6	35	13
	Commercial/ Industrial	31	17	12	1	20	0
	Agricultural	0	0	3	0	0	0
	Outbuilding	11	9	11	0	6	6
Structures Within 200 feet of the Reference Line	Residential	4	3	1	0	5	0
	Commercial/ Industrial	4	5	4	0	0	0
	Agricultural	0	0	1	0	0	0
	Outbuilding	1	1	3	0	1	4

<u>Alternative II-A (Applicant Proposed)</u>

Alternative II-A would cross 38 communication sites, 18 parks (includes 14 wildlife management areas), 9 communities, 1 cemetery, 1 school, and 1 church within the 2-mile transmission line corridor in Region II. The community of Nephi is transected by the reference line. The only communities within the 2-mile transmission line corridor that have census data are Nephi and Roosevelt City, with 2010 populations of 5,389 and 6,046, respectively. A full list of communities, parks and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-10**. There are 53 residential structures, 31 commercial/industrial structures, and 11 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 4 residential structures, 4 commercial/industrial structures, and 1 outbuilding within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. There are 3 dispersed recreation areas within the 2-mile transmission line corridor, the nearest being approximately 1,215 feet from the reference line. Alternative II-A contains the least number of communities within the 2-mile transmission line corridor. The Strawberry IRA and Cedar Knoll IRA micro-siting adjustments would not substantially affect the impact analysis for public health and safety. Sand dunes within Alternative II-A also may affect the safety of workers and the public during construction and operation (see Section 3.3 for further details). Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2,

Table 3.18-10 Human Resources by Alternative within Region II

	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Communities*	(Utah) Ioka, Upalco, Pines, Rio, Thistle, Gypsum Mill, Champlin, Nephi, Roosevelt City	(Colorado) Carbonera (Utah) Thompson Springs, Desert, Elba, Floy, Sagers, Vista, Cedar, Woodside, Nephi, Mount Pleasant	(Colorado) Carbonera (Utah) Thompson Springs, Desert, Elba, Floy Sagers, Vista, Emery, Moore, Harding, McCornick	(Utah) Red Wash, Squaw Crossing, Martin, Heiner, Wildcat, Coal City Clear Creek, Milburn, Champlin, Nephi, Helper	(Utah) Red Wash, Colton, Gilluly, Kyune, Mill Fork, Sky View, Soldier Summit, Tucker, Ioka, Pines, Rio, Thistle, Bridgeland, Champlin, Nephi, Roosevelt City	(Utah) Red Wash, Squaw Crossing, Gilluly, Mill Fork, Sky View, Soldier Summit, Tucker, Pines, Rio, Thistle
Parks or Developed Recreation Areas	(Utah) Currant Creek Wildlife Management Area (WMA), North Nebo WMA, Northwest Manti WMA (Birdseye), Northwest Manti WMA (Dairy Fork), Northwest Manti WMA (Hilltop), Northwest Manti WMA (Starvation), Strawberry River WMA, South Nebo WMA, Tabby Mountain WMA (Rabbit Gulch), Tabby Mountain WMA, Rabbit Gulch WMA, Wildcat WMA, Jackson WMA, Spencer Fork WMA, Strawberry River Day Use Area, Starvation State Park	(Utah) Triangle Ranch WMA, North Nebo WMA (Found Green), South Nebo WMA, Green River State Park	(Utah) Emery Farm Castle Dale Wildlife Management Area (WMA), Fillmore WMA, Green River State Park	(Utah) Triangle Ranch WMA, Hilltop WMA, Gordon Creek WMA, Northwest Manti WMA (Hilltop), South Nebo WMA (Triangle Ranch), Castle Gate Park	(Utah) Dairy Fork WMA, Jackson WMA, Spencer Fork WMA, Triangle Ranch WMA, Indian Canyon WMA, North Nebo WMA (Spencer Fork), Northwest Manti WMA (Birdseye), Northwest Manti WMA (Dairy Fork), Northwest Manti WMA (Lasson Draw), Northwest Manti WMA (Starvation), South Nebo WMA, and Bamberger Monument	(Utah) Dairy Fork WMA, Jackson WMA, Spencer Fork WMA, Triangle Ranch WMA
Other Sensitive Receptors	(Utah) Fruitland Cemetery, Church of Jesus Christ of Latter Day Saints, Church of Jesus Christ of Latter Day Saints	(Utah) Thompson Cemetery, Woodside Cemetery, Church of Jesus Christ of Latter Day Saints	(Utah) Thompson Cemetery, Church of Jesus Christ of Latter Day Saints	(Utah) Deadmans Grave Cemetery, Castle Gate Cemetery, Saint Anthony School, Sally Mauro School, Saint Anthony Catholic Church	(Utah) Deadmans Grave, Mill Fork Cemetery, Old Lake Cemetery, Church of Jesus Christ of Latter Day Saints, Church of Jesus Christ of Latter Day Saints	(Utah) Deadmans Grave, Mill Fork Cemetery, Church of Jesus Christ Latter Day Saints

* Some communities do not have census population data, are rural in nature, and may no longer be inhabited.

AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative II-B

Alternative II-B would cross 91 communication sites, 11 communities, 4 parks (includes 3 wildlife management areas and a state park), and 2 cemeteries within the 2-mile transmission line corridor in Region II. The nearest community within the corridor to the reference line is Nephi, Utah, which is transected by the reference line. Thompson Springs and Nephi, both in Utah, are the only communities within the 2-mile transmission line corridor that have census population data. The 2010 populations of Thompson Springs and Nephi were 39 and 5,389, respectively. A full list of communities, parks and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-10**. There are 5 residential structures, 17 commercial/industrial, and 9 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 3 residential structures, 5 commercial/industrial structures, and 1 outbuilding within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. Of the 145 recreation areas within the 2-mile wide corridor, all except four are dispersed recreation campsites. Alternative II-B contains the most recreation areas among the project alternatives. Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2, AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative II-C

Alternative II-C would cross 138 communication sites, 11 communities, 3 parks (includes 1 state park and 2 wildlife management areas), 1 church, and 1 cemetery that are within the 2-mile transmission line corridor in Region II. The nearest community within the corridor to the reference line is Carbonera, Colorado, located approximately 155 feet from the reference line. There is no census population data for Carbonera. Thompson Springs and Emery, both in Utah, are the only communities within the 2-mile transmission line corridor that have census population data. The populations of Thompson Springs and Emery in 2010 were 39 and 208, respectively. A full list of communities, parks and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-10**. There are 4 residential structures, 12 commercial/industrial structures, 3 agricultural structures, and 11 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 1 residential structure, 1 agricultural structure, 4 commercial/industrial structures, and 3 outbuildings within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. There are no dispersed recreation areas within the 2-mile transmission line corridor. Alternative II-C contains the most communication sites among the project alternatives. Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2, AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative II-D

Alternative II-D would cross 84 communication sites, 11 communities, 6 parks (includes 5 wildlife management areas), 2 cemeteries, 1 church, and 2 schools that are within the 2-mile transmission line corridor in Region II. The nearest community within the corridor to the reference line is Nephi, Utah, which is transected by the reference line. Clear Creek, Nephi, and Helper are the only communities within the 2-mile transmission line corridor that have census population data. The 2010 populations were: Clear Creek – 4; Nephi – 5,389; and Helper – 2,201. A full list of communities, parks and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-10**. There are

6 residential structures and 1 commercial/industrial structure within 500 feet of the proposed reference line. There are no structures within 200 feet of the proposed reference line. Of the 30 recreation areas within the 2-mile wide corridors, all except six are dispersed recreation campsites. This alternative has the least amount of structures within 200 feet of the reference line. Sand Dunes within Alternative II-D also may affect the safety of workers and the public during construction and operation (see Section 3.3 for further details). Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2, AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative II-E

Alternative II-E would cross 77 communication sites, 16 communities, 15 parks (includes 12 wildlife management areas), 3 cemeteries, 1 school, and 2 churches that are within the 2-mile transmission line corridor in Region II. The nearest community within the corridor to the reference line is Nephi, Utah, which is transected by the reference line. The 2010 populations of Nephi and Roosevelt City were 5,389 and 6,046, respectively. A full list of communities, parks and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-10**. There are 35 residential structures, 20 commercial/industrial structures, and 6 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 5 residential structures and 1 outbuilding within 200 feet of the proposed reference line. The majority of the commercial/industrial structures are oil and gas pads. Of the 15 recreation areas within the 2-mile wide transmission corridor, three are dispersed recreation campsites. Alternative II-E contains the greatest number of communities. Cedar Knoll IRA micro-siting adjustments would not substantially affect the impact analysis for public health and safety. Sand Dunes within Alternative II-A also may affect the safety of workers and the public during construction and operation (see Section 3.3 for further details). Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2, AC transmission lines would be converted to DC. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative II-F (Agency Preferred)

Alternative II-F would cross 99 communication sites, 10 communities, 6 parks (includes 4 wildlife management areas), 2 cemeteries, and 1 church that are within the 2-mile transmission corridor in Region II. The nearest community within the corridor to the reference line is Sky View, Utah, located approximately 685 feet from the reference line. There is no census population data for Sky View, and the community is rural in nature. A full list of communities, parks and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-10**. There are 7 residential structures and 1 commercial/industrial structure within 500 feet of the proposed centerline. There are no structures within 200 feet of the proposed centerline. There are two dispersed recreation areas within the 2-mile transmission line corridor. Cedar Knoll IRA micro-siting adjustments would not substantially affect the impact analysis for public health and safety. Under Design Option 3, Phase 1, AC transmission lines instead of DC transmission lines would be constructed. Under Phase 2, AC transmission lines would be converted to DC transmission lines. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative Variation in Region II

Emma Park Alternative Variation

There are no communities, public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.

Alternative Connectors in Region II

Table 3.18-11 summarizes impacts associated with the alternative connectors in Region II.

Table 3.18-11 Summary of Region II Alternative Connector Impacts for Public Health and Safety, Hazardous Materials

Alternative Connector	Analysis
Highway 191 Alternative Connector	There are no communities, public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor. There is one outbuilding within 500 feet of the reference line.
Castle Dale Alternative Connector	There are no communities, public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor. There no structures within 500 feet of the reference line.
Price Alternative Connector	There are 2 communities (Wattis and Wattis Junction) and 1 park (Gordon Creek Wildlife Management Area) within the 2-mile transmission line corridor. There is no census data for either community. There are no public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.
Lynndyl Alternative Connector	There are no communities, public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor. There is one commercial/industrial structure within 500 feet of the reference line.
IPP East Alternative Connector	There are no communities, public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.

Region II Conclusion

Alternative II-A, Alternative II-B, Alternative II-C, Alternative II-D, Alternative II-E, and Alternative II-F (Agency Preferred) would have similar impacts on public health and safety, with the exception that, as detailed in **Table 3.18-9**, Alternative II-E would affect more communities, residential structures, and other sensitive receptors than the remaining alternatives. This would increase the potential project construction and operation health and safety risk to residential occupants and visitors to sensitive receptors. However, the successful implementation of design features, BMPs, and mitigation **PH-1**, would result in all of the alternatives having a relatively low impact on public health and safety.

3.18.7.5 Region III

Table 3.18-12 provides a tabulation of impacts associated with the alternative routes in Region III.

Alternative III-A (Applicant Proposed)

Alternative III-A would entail crossing 16 communication sites, 1 park (the Jefferson Hunt Monument), 2 communities, the Mountain Meadows NHL and Site, and 1 cemetery that are within the 2-mile transmission line corridor in Region III. The community of Central, Utah, is transected by the reference line. The 2010 population of Central was 613. The community of Jackman, Nevada, is located 420 feet from the reference line. There is no census population data for Jackman. A list of communities, parks

Table 3.18-12 Summary of Region III Alternative Route Impacts for Public Health and Safety, Hazardous Materials

Parameter		Alternative III-A	Alternative III-B	Alternative III-C
Communities		2	8	9
Parks or developed/dispersed recreation areas (campgrounds, etc.)		1	1	1
Other Sensitive Receptors (schools and daycare centers; health care facilities such as hospitals or retirement and nursing homes; cemeteries; churches)		1	1	0
Communication Sites		16	111	117
Structures Within 500 feet of the Reference Line	Residential	7	2	2
	Commercial/Industrial	7	6	7
	Agricultural	1	0	1
	Outbuilding	10	9	10
Structures Within 200 feet of the Reference Line	Residential	2	1	1
	Commercial/Industrial	3	3	4
	Agricultural	0	0	0
	Outbuilding	4	4	4

and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-13**. There are 7 residential structures, 7 commercial/industrial structures, 1 agricultural structure, and 10 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 2 residential structures, 3 commercial/industrial structures, and 4 outbuildings within 200 feet of the proposed reference line. There are 16 dispersed recreation areas within the 2-mile transmission line corridor, the nearest being approximately 315 feet from the reference line. Alternative III-A contains the least communication sites and communities, but the most parks and recreation areas within the 2-mile transmission line corridor. Alternatives III-A and III-C contain the most structures within 200 feet of the reference line. Under Design Option 2, AC transmission lines instead of DC lines would be constructed. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Table 3.18-13 Human Resources by Alternative within Region III

	Alternative III-A	Alternative III-B	Alternative III-C
Communities*	(Utah) Central (Nevada) Jackman	(Utah) Modena, Bery, Heist, Yale Crossing, Zane (Nevada) Acoma, Brown, Moapa	(Utah) Modena, Bery, Heist, Yale Crossing, Zane (Nevada) Yoacham, Horseshoe Bend, Beaverdam, North Las Vegas
Parks or Developed Recreation Areas	(Utah) Jefferson Hunt Monument	(Nevada) Moapa Recreation Center Park	Old State Boundary Historical Marker
Other Sensitive Receptors	Mountain Meadows NHL and Site	Claude G Perkins Elementary School	N/A

* Some communities do not have census population data, are rural in nature, and may no longer be inhabited.

Alternative III-B (Agency Preferred)

Alternative III-B would cross 111 communication sites, 8 communities, 1 park (Moapa Recreation Center Park), and 1 school that are within the 2-mile transmission line corridor in Region III. The community within the corridor nearest to the reference line is Zane, Utah, located approximately 370 feet from the reference line. Moapa Town is the only community within the 2-mile transmission line corridor that has census population data. The 2010 population of Moapa Town was 1,025. A full list of communities, parts and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-13**. There are 2 residential structures, 6 commercial/industrial structures, and 9 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 1 residential structure, 3 commercial/ industrial buildings, and 4 outbuildings within 200 feet of the proposed reference line. There are no dispersed camping or other recreation areas within the 2-mile transmission line corridor. This alternative contains the least structures within the 200 feet of the reference line. Under Design Option 2, AC transmission lines instead of DC lines would be constructed. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative III-C

Alternative III-C would cross 117 communication sites, 9 communities, and 1 park (state boundary historical marker) that are within the 2-mile transmission line corridor in Region III. The community nearest to the reference line is North Las Vegas, Nevada, which intersects the reference line. Beryl, Utah, and North Las Vegas, Nevada, are the only communities within the 2-mile transmission line corridor that have census population data. The 2010 populations of Beryl and North Las Vegas were 197 and 216,961, respectively. A full list of communities, parks and developed recreation areas, and other sensitive receptors can be found in **Table 3.18-13**. There are 2 residential structures, 7 commercial/industrial structures, 1 agricultural structure, and 10 outbuildings within 500 feet of the proposed reference line. The number of structures decreases to 1 residential structure, 4 commercial/ industrial structures, and 4 outbuildings within 200 feet of the proposed reference line. There are no dispersed camping areas within the 2-mile transmission line corridor. Alternative III-C contains the most communication sites within the 2-mile transmission line corridor. Both Alternatives III-A and III-C contain the most structures within 200 feet of the reference line. Under Design Option 2, AC transmission lines instead of DC lines would be constructed. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative Variations in Region III

Table 3.18-14 summarizes potential impacts associated with the alternative variations in Region III.

Table 3.18-14 Summary of Region III Alternative Variation Impacts for Public Health and Safety, Hazardous Materials

Alternative Variation	Analysis
Ox Valley East Alternative Variation (Alternative III-A)	There would be three dispersed camping areas within the 2-mile transmission line corridor of this alternative variation. There also would be 1 residential structure and 1 outbuilding within 500 feet of the reference line. There is one outbuilding within 200 feet of the proposed reference line. This variation would bypass one segment of Alternative III-A. Within this segment is one park (the Mountain Meadows NHL and Site) and a cemetery. There are no structures within 500 feet of the reference line. Bypassing the Mountain Meadows NHL and Site would be the advantage to this alternative variation.
Ox Valley West Alternative Variation (Alternative III-A)	There would be 1 community and 4 dispersed camping areas within the 2-mile transmission line corridor of this alternative variation. There also would be one residential structure within 500 feet

Table 3.18-14 Summary of Region III Alternative Variation Impacts for Public Health and Safety, Hazardous Materials

Alternative Variation	Analysis
	of the reference line. There are no structures within 200 feet of the proposed reference line. This variation would bypass one segment of Alternative III-A. Within this segment is one park (the Mountain Meadows NHL and Site) and a cemetery. There are no structures within 500 feet of the bypassed segment of this reference line. Bypassing the Mountain Meadows NHL and Site would be the advantage to this alternative variation.
Pinto Alternative Variation	There would be 1 community, 1 cemetery, 14 dispersed camping areas, and 7 communication sites within the 2-mile transmission line corridor. The community of Central, Utah, is located 1,800 feet from reference line and had a 2010 population of 613. There are no structures within 500 feet of the reference line. This variation would bypass two segments of Alternative III-A. Within these segments are two parks (including the Mountain Meadows NHL and Site) and a cemetery. There are no structures within 500 feet of the reference line. Bypassing the Mountain Meadows NHL and Site would be the advantage to this alternative variation.

Alternative Connectors in Region III

Table 3.18-15 summarizes potential impacts associated with the alternative connectors in Region III.

Table 3.18-15 Summary of Region III Alternative Connector Impacts for Public Health and Safety, Hazardous Materials

Alternative Connector	Analysis
Avon Alternative Connector	There are no public gathering areas or recreation areas within the 2-mile transmission line corridor; however, there is one community, Avon, Utah. There is no census population data for Avon, which is representative of its rural nature. Avon is located approximately 740 feet from the reference line. There are no structures within 500 feet of the reference line. There are five communication sites within the 2-mile transmission line corridor.
Moapa Alternative Connector	There are no communities, public gathering areas, or recreation areas within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line. There are five communication sites within the 2-mile transmission line corridor.

Alternative Ground Electrode Systems in Region III

Table 3.18-16 provides a comparison of alternative electrode facility locations proposed near the Southern Terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Region III Conclusion

Alternative III-A, Alternative III-B (Agency Preferred), and Alternative III-C, as detailed in **Table 3.18-12**, would have similar impacts on public health and safety. The successful implementation of design features, BMPs, and mitigation **PH-1**, would result in all of the alternatives having a relatively low impact on public health and safety.

Table 3.18-16 Summary of Region III Alternative Ground Electrode System Location Impacts for Public Health and Safety, Hazardous Materials

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa- Carp Elgin Rd (Alternatives III-A and III-B)	There would be no communities, public gathering areas, recreation sites, or communication sites located within 1 mile of the proposed ground electrode system location. One communication site is located within a mile of the associated overhead electrical line. There are no structures within 500 feet of the proposed ground electrode system location or overhead electrical line.
Halfway Wash- Virgin River (Alternatives III-A and III-B)	There would be no communities, public gathering areas, recreation sites, or communication sites located within 1 mile of the proposed ground electrode system location or its associated overhead electrical line. There are no structures within 500 feet of the proposed ground electrode system location or overhead electrical line.
Halfway Wash East (Alternatives III-A and III-B)	There would be no communities, public gathering areas, or recreation sites located within 1 mile of the proposed ground electrode system location or overhead electrical line. Ten communication sites are located within a mile of the proposed location. There are no structures within 500 feet of the proposed ground electrode system location or overhead electrical line.
Meadow Valley 2 (Alternative III-C)	There would be no communities, public gathering areas, or recreation sites located within 1 mile of the proposed ground electrode system location. Four communication sites are located with 1 mile of the associated transmission line. There are no structures within 500 feet of the proposed ground electrode system location or its associated transmission line.

3.18.7.6 Region IV

Table 3.18-17 provides a tabulation of impacts associated with the alternative routes in Region IV.

Table 3.18-17 Summary of Region IV Alternative Route Impacts for Public Health and Safety, Hazardous Materials

Parameter		Alternative IV-A	Alternative IV-B	Alternative IV-C
Communities		2	1	1
Parks or developed recreation areas (campgrounds, etc)		0	1	1
Other Sensitive Receptors (schools and daycare centers; health care facilities such as hospitals or retirement and nursing homes; cemeteries; churches)		0	1	0
Communication Sites		20	77	23
Structures Within 500 feet of the Reference Line	Residential	11	9	9
	Commercial/Industrial	3	3	3
	Agricultural	0	0	0
	Outbuilding	0	0	0
Structures Within 200 feet of the Reference Line	Residential	0	0	0
	Commercial/Industrial	2	0	0
	Agricultural	0	0	0
	Outbuilding	0	0	0

Alternative IV-A (Applicant Proposed and Agency Preferred)

Alternative IV-A would cross 2 communities and 20 communication sites within the 2-mile transmission line corridor in Region IV. The communities of Henderson and Boulder City, both in Nevada, are transected by the reference line and had 2010 populations of 257,729 and 15,023, respectively. There are 11 residential structures and 3 commercial/industrial structures within 500 feet of the proposed reference line. The number of structures decreases to two commercial/industrial structures within 200 feet of the proposed reference line. No dispersed camping or other recreation areas are within the 2-mile transmission line corridor. This alternative contains the most structures within 200 feet of the reference line. Under Design Option 2, AC transmission lines instead of DC lines would be constructed. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative IV-B

Alternative IV-B would entail crossing 1 community, 77 communication sites, 1 beach area, and the Nevada State Veterans Home within the 2-mile transmission line corridor in Region IV. The Nevada State Veterans Home is located 1,690 feet from the reference line. The City of Boulder City, Nevada, is transected by the reference line and had a 2010 population of 15,023. There are 9 residential structures and 3 commercial/industrial structures within 500 feet of the proposed reference line. There are no structures within 200 feet of the proposed reference line. There are no dispersed camping areas within the 2-mile transmission line corridor. Alternative IV-B contains the most communication sites among the alternatives within the 2-mile transmission line corridor. Under Design Option 2, AC transmission lines instead of DC lines would be constructed. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative IV-C

Alternative IV-C would entail crossing 1 community, 23 communication sites, and 1 beach area within the 2-mile transmission line corridor in Region IV. The City of Boulder City, Nevada, is transected by the reference line and had a 2010 population of 15,023. There are 9 residential structures and 3 commercial/industrial structures within 500 feet of the proposed reference line. There are no structures within 200 feet of the proposed reference line. There is no dispersed camping or other recreation areas within the 2-mile transmission line corridor. Under Design Option 2, AC transmission lines instead of DC lines would be constructed. Impacts associated with AC transmission lines are detailed in Sections 3.18.7.1 and 3.18.7.2. After considering design features, BMPs and mitigation measure **PH-1**, Project construction and operation would not be expected to affect public health and safety significantly.

Alternative Variations in Region IV

Table 3.18-18 summarizes potential impacts associated with the alternative variations in Region IV.

Table 3.18-18 Summary of Region IV Alternative Variation Impacts for Public Health and Safety, Hazardous Materials

Alternative Variation	Analysis
Marketplace Alternative Variation (Alternative IV-B)	There are no sensitive receptors, recreation areas, or communication sites within the 2-mile transmission line corridor. The city of Boulder City, Nevada, is transected by the alternative variation reference line. There are no structures within 500 feet of the reference line. This variation would bypass one segment of Alternative IV-B. Within this segment in the 2-mile transmission line corridor is one communication site. There is no commercial/ industrial structure within 500 feet of the reference line. There would be no advantage to this alternative variation as a result of the presence of Boulder City within the 2-mile transmission line corridor.

Alternative Connectors in Region IV

Table 3.18-19 summarizes impacts and advantages associated with the alternative connectors in Region IV.

Table 3.18-19 Summary of Region IV Alternative Connector Impacts for Public Health and Safety, Hazardous Materials

Alternative Connector	Analysis
Sunrise Mountain Alternative Connector	There are no communities, public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.
Lake Las Vegas Alternative Connector	There are no public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor; however, there are 2 communication sites and 1 community (Henderson, Nevada). One industrial structure and 1 outbuilding would be within 500 feet of the reference line.
Three Kids Mine Alternative Connector	There are no public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor; however, there is one community (Henderson, Nevada). There are no structures within 500 feet of the reference line.
River Mountains Alternative Connector	There are no public gathering areas, recreation areas, or communication sites within the 2-mile transmission line corridor; however, there is one community (Henderson, Nevada). One industrial structure would be within 500 feet of the reference line.
Railroad Pass Alternative Connector (Alternatives IV-A and IV-B)	Impacts from this alternative would be limited to 3 communities and 6 communication sites. The communities of Texas Acres, Henderson, and Boulder City, Nevada, are located within the 2-mile transmission line corridor. There are no structures within 500 feet of the reference line.

Region IV Conclusion

Alternative IV-A (Agency Preferred), Alternative IV-B, and Alternative IV-C would have similar impacts on public health and safety, with the exception that, as detailed in **Table 3.18-17**, Alternative IV-A would affect a greater number of communities and residential structures than the remaining alternatives. This would increase the potential project construction and operation health and safety risk to residential occupants. However, the successful implementation of design features, BMPs, and mitigation **PH-1**, would result in all of the alternatives having a relatively low impact on public health and safety.

3.18.7.7 Impacts to Public Health and Safety from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. Human exposures to noise associated with the proposed project would not occur. There would be no safety concerns from construction of the proposed Project. Existing EMF levels and health and safety considerations from transmission lines and substations in the area would continue. No hazardous materials would be used, released, or uncovered.

3.18.7.8 Residual Impacts

Residual impacts are impacts to a resource remaining after implementation of mitigation measures. For the proposed Project, these residual impacts include the increase in noise levels in excess of USEPA guidelines to residences near construction activities. These residual impacts would be short-term, ending once construction activities were completed in a given area.

3.18.7.9 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible commitment of resources associated with public health and safety. Impacts related to residences from construction noise would be irretrievable, ending however, once construction activities were completed in a given area.

3.18.7.10 Relationship Between Local Short-term Uses and Long-term Productivity

There would be relationship between local short-term uses and long-term productivity associated with public health and safety.

3.19 Wild Horse Management Areas

This section describes existing wild horse HMAs and HAs in the analysis area and discloses potential Project impacts on those HMAs and HAs.

3.19.1 Regulatory Background

Passage of the Wild Free-Roaming Horses and Burro Act (P.L. 92-195) in 1971 requires the BLM to protect, manage, and control wild free-roaming horses and burros on public lands. The act requires the BLM to manage wild horses and burros in a manner designed to achieve and maintain a thriving natural ecological balance on the public lands.

HMAs are areas designated within RMPs for wild horse management. HAs are those places where wild horses were counted but are not designated for wild horse management within an RMP. Appropriate management levels (AMLs) for wild horses and burros are established in accordance with objectives and management actions through Multiple Use Decisions. Multiple Use Decisions establish the appropriate minimum and maximum number of wild horses to be managed within each grazing allotment contained within an HMA. The BLM staff studies natural resources such as vegetation and wildlife habitat to help determine the AML, taking into consideration uses such as livestock grazing, wildlife use, recreation, and the BLM's multiple-use mission under FLPMA. Annual monitoring data are collected to evaluate progress toward meeting management objectives. When herd sizes exceed the AML or resource damages occur, animals are gathered and offered for adoption. Other factors such as drought, lack of forage, public nuisance or wildfire also may require the BLM to remove some animals from the range.

3.19.2 Data Sources

Information regarding wild horse resources within the analysis area was obtained from a review of existing published sources, RMPs, and applicable county land use plans. Current information regarding conditions in the HMAs/HAs was obtained from available GIS data, topographic maps, and internet-based tools including GoogleEarth™. A list of RMPs used in the development of this section is presented in **Table 1-3**. Vegetation species nomenclature is consistent with the NRCS Plants Database (NRCS 2010), unless otherwise specified.

Data sources include published maps and reports and internet websites of the USGS and UGS. Other data sources included academic and professional journals and publications. Livestock grazing allotment information was provided by the BLM FOs crossed by the various routes. There are no HMAs or HAs within NFS lands.

3.19.3 Analysis Area

The analysis area is defined as the 250-foot-wide transmission line ROW occurring within HMAs or HAs.

3.19.4 Baseline Description

The 10 wild horse HMAs/HAs shown in **Table 3.19-1** are located within the analysis area. These designated HMAs/HAs are located on BLM land. During periodic wild horse roundups, BLM uses helicopters within the HMAs/HAs to assist in directing the horses into the designated collection areas. Due to the necessary use of helicopters, BLM prefers that transmission lines located within HMAs/HAs be located parallel to existing transmission lines to the extent feasible.

Table 3.19-1 Wild Horse Herd Management Areas and Herd Areas within the Analysis Area

Location/Mgt Entity[1]	HMA/HA	Acreage	Description
Region I			
Wyoming/Rawlins FO	Adobe Town HMA	472,812	AML is 700 horses.
Wyoming/Rock Springs FO	Salt Wells Creek HMA	1,193,283	AML is 365 horses.
Colorado/Little Snake FO	Sand Wash Basin HMA	157,730	AML is 163 to 363 horses; population is about 411. The boundary of the HMA is fenced, except along State Highway 318, generally preventing wild horses from entering or leaving the HMA.
Region II			
Colorado/White River FO	Piceance-East Douglas Creek HMA	190,130	AML is 135 to 235 horses; 2010 population was about 265 within the HMA and 115 outside the HMA.
Colorado/White River FO	North Piceance HA	76,959	Managed for 0 to 10 years to provide forage for a herd of 0 to 50 horses in each HA. The objective for anything greater than 10 years would be to remove all wild horses from these areas; however, this decision currently is being challenged in court.
Colorado/White River FO	West Douglas Creek HA	123,387	Managed for 0 to 10 years to provide forage for a herd of 0 to 50 horses in each HA. The objective for anything greater than 10 years would be to remove all wild horses from these areas; however, this decision currently is being challenged in court.
Utah/Vernal FO	Hill Creek HMA	88,173	AML of 195.
Region III			
Utah/Cedar City District	Chloride Canyon HMA	211,585	2008 AML of 390, estimated horses population of 531.
Utah/Cedar City District	North Hills HMA	49,900	Managed in cooperation with the Dixie NF Pine Valley Ranger District's North Hills Wild Horse Territory (24,029 acres). Together, the combined area is referred to as the North Hills Wild Horse Management Plan Area (WHMPA) and comprises 74,000 acres. 250 wild horses within the HMA and Wild Horse Territory. AML of 40-60.
Nevada/Ely District	Eagle HMA	670,000	AML of 100 to 210 horses; 595 horses as of 2009.

[1] There are no wild horse HMAs/HAs in Region IV.

Sources: BLM 2012a,b,c,d; 2011; 2010; 2008a,b,c; 1997a,b.

3.19.5 Impacts to Wild Horse HMAs and HAs

3.19.5.1 Impacts from Terminal Construction and Operation

There are no HMAs/HAs within or near the northern or southern terminal areas.

Under Design Option 2, the Southern Terminal would be located near the IPP in Utah instead of at the Marketplace Hub in Nevada, and the ground electrode system would be within 50 miles of the IPP in Mallard County, Utah. Design Option 2 would have no effects to HMAs/HAs because there are no HMAs/HAs within the relocated Southern Terminal or electrode bed facilities.

Under Design Option 3, a substation would be located near the existing IPP substation in Utah for AC operation until phase two of the Project is completed. This substation would not affect any HMAs/HAs.

3.19.5.2 Impacts Common to All Alternative Routes and Associated Facilities

In general, impacts to wild horses and HMAs/HAs would result from noise and increased human activity during installation of the transmission line towers, clearing and grading existing and new access roads, vehicle operation in areas where overland vehicle travel would occur, and use of temporary laydown areas. Construction activities and operation of the transmission line could impact the ability of the BLM to conduct future wild horse gathers in and near the transmission line area. Each HMA/HA is discussed separately by region below.

Design Option 2 would involve modifications of proposed transmission facilities that would apply to all alternatives. Under Design Option 2, the transmission line would be AC from Southern Terminal near the IPP to the Marketplace Hub in Nevada. Unlike DC power lines, AC transmission lines can cause induced current in nearby objects, such as fences or other equipment in very close proximity to the transmission line. In order to minimize the potential for electric shock, fences and other structures with metal surfaces located within 300 feet of the centerline would be grounded. All metal irrigation systems and fences that parallel the AC transmission line for distances of 500 feet or more within 300 feet of the centerline would be grounded. Additionally, all fences that cross under the AC transmission line also would be grounded (**Appendix D**). Section 3.18, Public Health and Safety, provides more information regarding impacts from AC lines.

Design Option 3 also would involve modifications of proposed transmission facilities that would apply to all alternatives. The difference between this design option and the Proposed Action include development of a substation on BLM lands directly adjacent to the IPP within Millard County, Utah. Design Option 3 would have no new or additional effects to HMAs/HAs because there are no HMAs/HAs within the proposed location for the substation. Timing of impacts to HMAs/HAs as described under the Proposed Project would vary due to construction schedule differences.

3.19.5.3 Region I

Within Region I, two HMAs would be impacted by the alternative routes. **Table 3.19-2** provides a summary of acreage impacts. The Salt Wells Creek HMA would not be affected by the proposed Project route or its alternatives.

Table 3.19-2 Impacts to Region I HMAs/HAs by Alternative

HMA	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Adobe Town HMA				
250-foot-wide transmission line ROW miles/acres (% HMA)	13/407 (0.1%)	17/499 (0.1%)	N/A	1/36 (<0.1%)

Table 3.19-2 Impacts to Region I HMAs/HAs by Alternative

HMA	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Surface disturbance: construction/operations (acres)	174/47	219/48	N/A	26/5
2-mile transmission line corridor (% HMA)	17,248 (3.6%)	20,948 (4.4%)	N/A	4,038 (0.9%)
Sand Wash Basin HMA				
250 foot-wide transmission line ROW miles/acres (% HMA)	8/244 (0.2%)	N/A	N/A	N/A
Surface disturbance: construction/operations (% HMA)	110/30	2/1	N/A	2/1
2-mile transmission line corridor acres (% HMA)	8,163 (5.2%)	695 (0.4%)	N/A	695 (0.4%)

Alternative I-A (Applicant Proposed)

Under Alternative I-A, two HMAs would be affected by construction and operation of the transmission line.

Approximately 13 miles of the 250-foot-wide transmission line ROW would cross the 472,812-acre Adobe Town HMA. During construction, up to 407 acres (less than 0.1 percent of the HMA) would be within the 250-foot-wide transmission line ROW. This area would be subject to surface disturbance and/or vegetation removal and maintenance that could affect forage for wild horses. Approximately 174 acres (less than 0.05 percent of the HMA) would be disturbed for tower placement and road development during the construction phase; a third of that disturbance (about 47 acres) would be permanent. Approximately 8 miles of the 250-foot-wide transmission line ROW would cross the 157,730-acre Sand Wash Basin HMA. During construction, up to 244 acres (less than 0.2 percent of the HMA) would be within the 250-foot-wide transmission line ROW. Approximately 110 acres (less than 0.1 percent of the HMA) would be disturbed for tower placement and road development during construction phase; a quarter of that disturbance (approximately 30 acres) would be permanent. The land area within each HMA that would not be affected by tower placement or road development would remain available for wild horse forage and shelter. All water sources would be completely avoided (i.e., spanned by aerial crossing). Any areas of temporary disturbance would be restored to pre-construction contours and restored with BLM-approved seed mixtures (see **Appendix C**; **Table C-1**, VEG-2).

Wild horses within the HMAs also would be subject to noise and increased human activity during installation of the transmission line towers, clearing and grading of existing and new access roads, vehicle operation in areas where overland vehicle travel would occur, and use of temporary laydown areas and tensioning sites. Depending on topography, noise could travel the width of the 2-mile transmission line corridor. This would impact up to 17,248 acres within the Adobe Town HMA (3.6 percent of the HMA), and 8,163 acres within the Sand Wash Basin HMA (5.2 percent of the HMA). This disturbance would likely last 3 to 12 weeks, depending on the length of time it takes for the line to be constructed across the HMA.

Construction activities and operation of the transmission line could impact the ability of the BLM to conduct future wild horse gathers in and near the transmission line area. However, no gathers currently are planned within either HMA.

Alternative I-B

Under Alternative I-B, impacts to the Adobe Town HMA would be similar to those described under Alternative I-A, but would affect slightly more acreage (up to 4.4 percent of the HMA would be within the 2-mile transmission line corridor).

The transmission reference line would not cross Sand Wash Basin HMA and there would be less than 2 acres of construction disturbance within the HMA. Approximately 0.4 percent of the HMA would be within the 2-mile transmission line corridor, with impacts similar to those described under Alternative I-A.

Alternative I-C

Alternative I-C would not cross any designated HMAs.

Alternative I-D (Agency Preferred)

Alternative I-D would cross less than 1 mile of the Adobe Town HMA. Impacts would be similar to those described under Alternative I-A, except much less acreage would be impacted (approximately 10 percent of the Alternative I-A acreage within the 250-foot-wide transmission line ROW and 25 percent of that within the 2-mile transmission line corridor).

Impacts to the Sand Wash Basin HMA would be the same as those described under Alternative I-B.

The three Tuttle easement micro-siting options would not change impacts to wild horses as described above.

Alternative I-D would affect approximately 0.8 percent of 2 HMAs.

Alternative Connectors in Region I

There are no HMAs/HAs affected by the Mexican Flats, Baggs, Fivemile Point North, or Fivemile Point South connectors.

Alternative Ground Electrode Systems in Region I

A ground electrode system of approximately 600 acres in size within 50 to 100 miles of the Northern Terminal in Region I would be required. The ground electrode system alternative approximate locations in Region I are depicted in Chapter 2.0 on **Figure 2-21**. Approximately 25,283 acres of the conceptual Shell Creek Ground Electrode System siting area would be located within the 1,193,283 acre-Salt Wells Creek HMA and 23 acres would be located within the 472,812-acre Adobe Town HMA. Approximately 19 miles of the accompanying 34.5-kV AC overhead line transmission line would be located within the Salt Wells Creek HMA. During construction, there would be 223 acres of construction disturbance within the Salt Wells Creek HMA (less than 0.01 percent of the HMA), of which about 89 acres would be permanent. There would be no construction disturbance within the Adobe Town HMA. Impacts from construction would be similar to those described under the Region I alternatives. There would be no impacts to Sand Wash Basin HMA.

Region I Conclusions

Alternative I-A would have the most impact on wild horses, affecting between 4 and 5 percent of two HMAs.

3.19.5.4 Region II

Within Region II, four HMAs/HAs would be impacted by alternative routes. The HMAs/HAs crossed by the alternatives in Region II are summarized in **Table 3.19-3**.

Table 3.19-3 Impacts to Region II HMAs/HAs by Alternative

HMA	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Piceance-East Douglas Creek HMA						
250 foot-wide transmission line ROW miles/acres (% HMA)	N/A	1/31 (<0.02%)	1/31 (<0.02%)	N/A	N/A	N/A
Surface disturbance: construction/operations (acres)	N/A	< 1/<1	<1/<1	N/A	N/A	N/A
2-mile transmission line corridor acres (% HMA)	N/A	1,049 (0.6%)	1,049 (0.6%)	N/A	N/A	N/A
North Piceance HA						
250-foot-wide transmission line ROW miles/acres (% HA)	N/A	7/218 (0.3%)	7/218 (0.3%)	N/A	N/A	N/A
Surface disturbance: construction/operations (acres)	N/A	91/23	91/23	N/A	N/A	N/A
2-mile transmission line corridor acres (% HA)	N/A	5,902 (7.7%)	5,902 (7.7%)	N/A	N/A	N/A
West Douglas Creek HA						
250-foot-wide transmission line ROW miles/acres (% HA)	N/A	13/390 (<0.3%)	13/390 (<0.3%)	N/A	N/A	N/A
Surface disturbance: construction/operations (acres)	N/A	192/49	192/49	N/A	N/A	N/A
2-mile transmission line corridor acres (% HA)	N/A	13,966 (11%)	13,966 (11%)	N/A	N/A	N/A
Hill Creek HMA						
250-foot-wide transmission line ROW miles/acres (% HMA)	N/A	N/A	N/A	N/A	N/A	N/A
Surface disturbance: construction/operations (acres)	N/A	N/A	N/A	1/0	N/A	1/0
2-mile transmission line corridor acres (% HMA)	N/A	N/A	N/A	123 (<0.1%)	N/A	123 (<0.1%)

Alternative II-A (Applicant Proposed)

Alternative II-A would not cross any designated HMAs/HAs. The Strawberry IRA micro-siting options would not affect wild horses, as there are no HMAs or HAs within the micro-siting locations.

Alternative II-B

Under Alternative II-B, approximately 1 mile of the 250-foot-wide transmission line ROW would cross the 190,130-acre Piceance-East Douglas Creek HMA. During construction, up to 31 acres (less than 0.02 percent of the HMA) would be within the 250-foot-wide transmission line ROW. This area would be subject to surface disturbance and/or vegetation removal and maintenance that could affect forage for wild horses. Less than one acre would be disturbed for tower placement and road development during construction and operation phases. The land area in the HMA that would not be affected by tower placement or road development would remain available for wild horse forage and shelter and all intermittent streams, waterholes, or reservoirs used by wild horses would be completely avoided (i.e., spanned by aerial crossing). Any areas of temporary disturbance would be restored to pre-construction contours and restored with BLM approved seed mixtures (see **Appendix C**; **Table C-1**, **VEG-2**).

Wild horses within the Piceance-East Douglass Creek HMA would also be subject to noise and increased human activity during installation of the transmission line towers, clearing and grading existing and new access roads, vehicle operation in areas where overland vehicle travel would occur, and use of temporary laydown areas and tensioning sites. Depending on topography, noise could travel the width of the 2-mile transmission line corridor. This would impact up to 1,049 acres (0.6 percent of the HMA). This disturbance would likely last 3 to 12 weeks, depending on the length of time it takes for the line to be constructed across the HMA.

Under Alternative II-B, the 250-foot-wide transmission line ROW would cross 7 miles of the 76,959-acre North Piceance HA and 13 miles of the 123,387-acre West Douglas HA. Impacts to these HAs would be similar to those identified for the Piceance-East Douglas Creek HMA but would affect a greater portion of both of these HAs. The 250-foot-wide transmission line ROW would encompass 218 acres of the North Piceance HA (0.3 percent of the HA). Approximately 91 acres (0.1 percent of the HA) would be disturbed for tower placement and road development during the construction phase; a quarter of that disturbance (approximately 23 acres) would be permanent. The 2-mile transmission line corridor would encompass 7.7 percent of the HA. The 250-foot-wide transmission line ROW would encompass 390 acres of the West Douglas HA (less than 0.3 percent of the HA). Approximately 192 acres (0.2 percent of the HA) would be disturbed for tower placement and road development during the construction phase; a quarter of that disturbance (about 49 acres) would be permanent. The 2-mile transmission line corridor would encompass 11 percent of the HA.

Construction activities and operation of the transmission line could impact the ability of the BLM to conduct future wild horse gathers in and near the transmission line area. As of September 2011, the BLM White River FO proposed to gather approximately 382 wild horses from the Piceance-East Douglas Creek HMA. Additionally, as of 2012, there were approximately 185 wild horses within the West Douglas Creek HA, and BLM was awaiting the Decision Record for a proposed emergency gather of excess horses due to ongoing drought conditions. The BLM also has indicated that it may be necessary to conduct multiple gathers (pursuant to NEPA analysis) in the West Douglas Creek HA over the duration of drought conditions (BLM 2012). The following mitigation is proposed to reduce impacts to planned gathers:

***WH-1**: Construction activities would be suspended as needed during wild horse gathers, as determined through consultation with the BLM.*

Application of **WH-1** would reduce impacts to wild horse management during construction but would not mitigate for the impacts to gathers during operations of the line.

The 250-foot-wide transmission line ROW would cross the Piceance-East Douglas Creek HMA and North Piceance HA near their western borders, leaving the majority of the HMA and HA unaffected. The 250-foot-wide transmission line ROW would bisect the western portion of the West Douglas HA. Presence of a transmission line in this area would affect the use of helicopters for the gather of wild horses.

Alternative II-B would not cross the Hill Creek HMA.

Alternative II-C

Impacts to HAs and HMAs under Alternative II-C would be the same as described under Alternative II-B because the routes and mileages are the same.

Alternative II-D

The 250-foot-wide transmission line ROW for Alternative II-D would not cross any designated HMAs. Approximately 123 acres of the 88,173-acre Hill Creek HMA would be within the 2-mile transmission line corridor. This is 0.1 percent of the HMA. Impacts would be similar to those described for the 2-mile

transmission line impacts discussed under Alternative II-B, and primarily would be limited to noise disturbance.

Alternative II-E

Alternative II-E would not cross any designated HMAs or HAs.

Alternative II-F (Agency Preferred)

Impacts to HMAs and HAs would be the same as under Alternative II-D.

The two Cedar Knoll IRA micro-siting options would not affect wild horses, as there are no HMAs or HAs within the micro-siting locations.

Alternative Variation in Region II

Emma Park

The Emma Park Alternative Variation would not cross any designated HMAs or HAs.

Alternative Connectors in Region II

The Lynndyl, IPP East, Castle Dale, Price, or Highway 191 alternative connectors would not cross any designated HMAs or HAs.

Region II Conclusions

Alternatives II-B and II-C would have the most impact on wild horses, affecting between 0.6 and 11 percent of three HMAs/HAs. Alternatives II-A and II-E would not affect any HMAs/HAs.

Alternative II-D and Alternative II-F would each affect less than 1 percent of one HMA.

3.19.5.5 Region III

Within Region III, three HMAs would be impacted by the alternative routes. **Table 3.19-4** provides a summary of acreage impacts to the HMAs within Region III.

Alternative III-A (Applicant Proposed)

Under Alternative III-A, approximately 2 miles of the 250-foot-wide transmission line ROW would cross the 211,585-acre Chloride Canyon HMA. During construction, up to 69 acres (less than 0.03 percent of the HMA) would be within the 250-foot-wide transmission line ROW. This area would be subject to surface disturbance and/or vegetation removal and maintenance that could affect forage for wild horses. Approximately 100 acres (0.05 percent of the HMA) would be disturbed for tower placement and road development during the construction phase; a quarter of that disturbance (approximately 24 acres) would be permanent. The land area in the HMA that would not be affected by tower placement or road development would remain available for wild horse forage and shelter. All water sources would be completely avoided (i.e., spanned by aerial crossing). Any areas of temporary disturbance would be restored to pre-construction contours and restored with BLM approved seed mixtures (see **Appendix C**; **Table C-1**, **VEG-2**).

Wild horses within the Chloride Canyon HMA also would be subject to noise and increased human activity during installation of the transmission line towers, clearing and grading existing and new access roads, vehicle operation in areas where overland vehicle travel would occur, and use of temporary laydown areas and tensioning sites. Depending on topography, noise could travel the width of the 2-mile transmission line corridor. This would impact up to 2,909 acres (1.4 percent of the HMA). However, it is important to note that transmission line construction is sequential in nature; therefore, it is not likely that all 10 miles of line would be undergoing construction at any one time.

Table 3.19-4 Impacts to Region III HMAs/HAs by Alternative

HMA	Alternative III-A	Alternative III-B	Alternative III-C
Chloride Canyon HMA			
250-foot-wide transmission line ROW miles/acres (% HMA)	2/69 (<0.03%)	N/A	N/A
Surface disturbance: construction/operations (acres)	100/24	N/A	N/A
2-mile transmission line corridor acres (% HMA)	2,909 (1.4%)	N/A	N/A
North Hills HMA			
250-foot-wide transmission line ROW miles/acres (% HMA)	N/A	N/A	N/A
Surface disturbance: construction/operations (acres)	N/A	11/3	10/2
2-mile transmission line corridor acres (% HMA)	N/A	2,795 (5.6%)	2,721 (5.5%)
Eagle HMA			
250-foot-wide transmission line ROW miles/acres (% HMA)	N/A	N/A	N/A
Surface disturbance: construction/operations (acres)	N/A	<1/<1	<1/<1
2-mile transmission line corridor acres (% HMA)	N/A	56 (<0.01%)	56 (<0.01%)

Construction activities and operation of the transmission line could impact the ability of the BLM to conduct future wild horse gathers in and near the transmission line area. Application of **WH-1** would reduce impacts to wild horse management during construction, but would not mitigate for the impacts to gathers during operations of the line.

Alternative III-B would not cross the North Hills or Eagle HMAs.

Alternative III-B (Agency Preferred)

The 250-foot-wide transmission line ROW for Alternative III-B would not cross any designated HMAs. Approximately 2,795 acres of the 49,900-acre North Hills HMA and 5.6 acres of the 670,000-acre Eagle HMA would be within the 2-mile transmission line corridor. These acreages comprise 5.6 percent of the North Hills HMA and less than 0.01 percent of the Eagle HMA. Impacts would be similar to those described under Alternative II-A, and would primary be limited noise disturbance. The area of disturbance represents maximum disturbance and would vary by topography.

Application of **WH-1** would reduce impacts to wild horse management during construction, but would not mitigate for the impacts to gathers during operations of the line.

Alternative III-C

Impacts under Alternative III-C would be the same as under Alternative III-B except that slightly less acreage (5.5 percent) of the North Hills HMA would be within the 2-mile transmission line corridor.

Application of **WH-1** would reduce impacts to wild horse management during construction, but would not mitigate for the impacts to gathers during operations of the line.

Alternative Variations in Region III

Under the Pinto Alternative Variation, the 250-foot-wide transmission line HMA would cross 0.4 mile of the Chloride Canyon HMA. These impacts would be the same as the comparable portion of Alternative III-A. The Ox Valley East and West Alternative Variations would not cross any HMAs.

Alternative Connector in Region III

The Moapa Alternative Connector and the Avon Alternative Connector would not cross any HMAs.

Alternative Ground Electrode Systems in Region III

A ground electrode system of approximately 600 acres in size would be necessary in Region III within 50 to 100 miles of the southern terminal as discussed in Chapter 2. The ground electrode system alternative locations in Region III are depicted in Chapter 2.0 on **Figure 2-23**. The locations are not within or near HMAs.

Region III Conclusions

Alternatives III-B and III-C would have very similar impacts on wild horses, affecting approximately 6 percent of one HMA (with a minimal acreage within a second HMA). Alternative III-A would have the least impact on HMAs, affecting approximately 1 percent of one HMA.

3.19.5.6 Region IV

There are no wild horse HMAs/HAs within Region IV.

3.19.5.7 Residual Impacts

Residual effects to HMAs/HAs from the transmission line would be the same as those described under each action alternative and would consist primarily of loss of vegetation and forage as well as potential impacts to wild horse gathers due to the presence of a transmission line that could impinge upon helicopter use in portions of the HMA/HA.

3.19.5.8 Impacts to Wild Horses from the No Action Alternative

Under the No Action Alternative, the Project would not be developed. There would be no impacts to HMAs/HAs beyond existing conditions and trends.

3.19.5.9 Irreversible and Irretrievable Commitments of Resources

All operation impacts to the values of HMAs/HAs described above would be irretrievable until transmission line decommissioning, after which time the full value of impacted HMAs/HAs would be reclaimed. However, it should be noted, that reclamation activities may have limited success in areas with poor soils, some vegetation communities would take years to reestablish, and some areas may never return to their former vegetation cover and composition. As such, these impacts may represent an irreversible commitment of vegetation resources.

3.19.5.10 Relationship Between Local Short-term Uses and Long-term Productivity

Implementation of the Project would result in the use of portions of some HMAs/HAs as ROW corridors. Long-term productivity of the HMAs/HAs would be largely unaffected except for areas where reclamation may have limited success.

3.20 Lands with Wilderness Characteristics

3.20.1 Regulatory Background

This section describes LWCs in the analysis area and discloses potential Project impacts to LWCs.

Managing the wilderness resource is part of the BLM's multiple use mission. LWCs provide a range of uses and benefits in addition to their value as settings for solitude or primitive and unconfined recreation. Section 201 of the FLPMA requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values, which includes wilderness characteristics. Section 201 also provides that the preparation and maintenance of the inventory shall not, itself, change or prevent change of the management or use of public lands. Regardless of past inventory, the BLM must maintain and update as necessary, its inventory of wilderness resources on public lands.

BLM Manuals 6310 and 6320 issued on March 15, 2012, clarify that the requirements of Section 201 of FLPMA remain in effect. The manuals identify specific circumstances where the BLM will update or initiate a wilderness characteristics inventory, including the following:

1. The public or the BLM identifies wilderness characteristics as an issue during the NEPA process.
2. The BLM has new information concerning resource conditions, including wilderness characteristics information submitted by the public that meets the BLM's minimum standard (as described in BLM Manual 6310).
3. A project that may impact wilderness characteristics is undergoing NEPA analysis.

The primary function of an inventory is to determine the presence or absence of wilderness characteristics. The inventory for wilderness characteristics is based on criteria, defined in Section 2(c) of the Wilderness Act and incorporated in Section 603 of the FLPMA, for sufficient size, naturalness, outstanding opportunities for either solitude or primitive and unconfined recreation, and supplemental values (ecological, geological, or other features of scientific, educational, scenic, or historical values). Inventory areas that meet the size, naturalness, and outstanding solitude and/or the outstanding primitive and unconfined recreation criteria are LWCs. The BLM may conduct the inventory of lands, including LWCs, using available information (e.g., existing maps, photos, records related to range projects, monitoring data) and field verification.

3.20.2 Data Sources

Updated LWC inventory files were obtained from affected BLM FOs. Information was provided by the following: Rawlins FO, Little Snake FO, White River FO, Utah SO, Moab FO, Cedar City FO, and Caliente FO.

3.20.3 Analysis Area

The analysis area consists of the 2-mile proposed and alternative transmission line corridor areas as well as the siting areas for the terminals and electrode beds.

3.20.4 Baseline Description

Many BLM field offices have retained, and in some cases maintained, the wilderness inventory units developed in their jurisdiction during the late 1970s or early 1980s. However, when no inventory units have been established or no land use plan decisions have been made regarding LWCs, proposed projects may be required to inventory and identify LWCs and analyze impacts to LWCs in the associated NEPA document. A desktop analysis was conducted to determine whether any of the proposed or alternative corridors would directly affect any LWCs. Available information regarding existing wilderness inventories

was obtained from each BLM field office. Field verification of previously unsurveyed inventory units was completed in the summer and fall of 2012.

Figures 3.20-1 through **3.20-3** show existing LWC units that are within the analysis area. Previously unsurveyed units actively undergoing field verification are being considered as LWC for the purposes of this evaluation. There are 51 LWC units within the analysis area.

3.20.5 Regional Summary

Table 3.20-1 shows LWC units within the analysis area. These units are depicted in **Figures 3.20-1** through **3.20-3**.

While all units shown in **Table 3.20-1** meet the criteria for LWC, only one LWC unit (Mexican Mountain, Price FO) has an approved RMP decision that intends to manage the unit as a natural area to protect, preserve, and maintain wilderness characteristics.

Some units shown in **Table 3.20-1** have been evaluated in an RMP process, but the BLM determined to not manage these areas for their wilderness character, including affected LWC units in the following FOs: Vernal, Moab, and Price. The remaining units shown in **Table 3.20-1** have not been formally evaluated in an RMP process for appropriate management decisions for wilderness character.

3.20.6 Impacts to LWC

The analysis consists of determining whether LWC units are intersected and whether remaining portions would continue to meet LWC criteria. The analysis considers:

- Any loss of wilderness characteristics in areas that the BLM has administratively made a decision to protect; and
- Any impact to existing wilderness characteristics that would negate the eligibility of the whole inventoried area for consideration in a future planning effort for wilderness character protection.

3.20.6.1 Impacts from Terminal Construction, Operation, and Decommissioning

This section discloses impacts to land uses that would occur from construction and operation of the Northern and Southern terminals, which are common to all action alternatives.

<u>Northern Terminal</u>

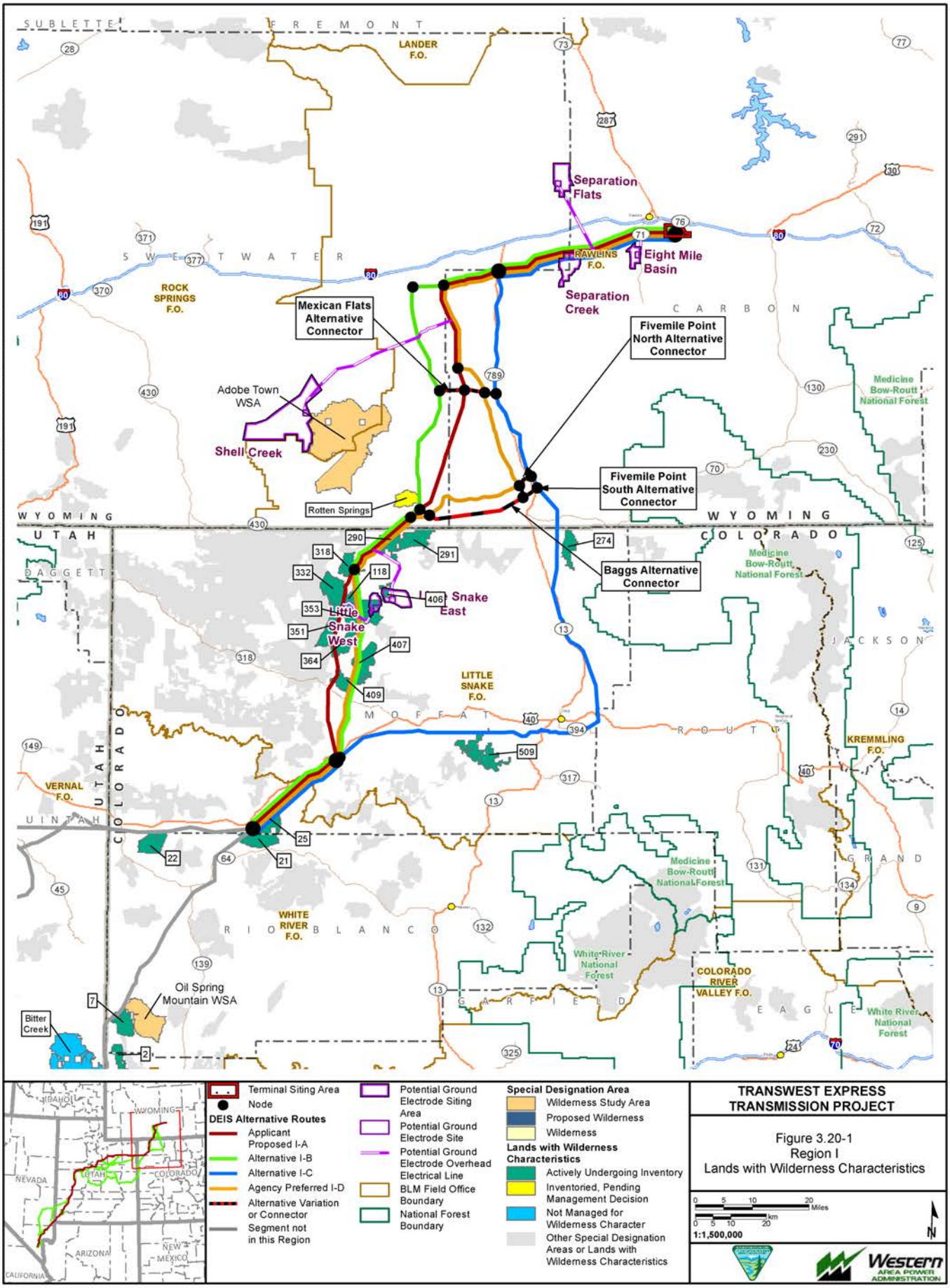
No LWCs were identified within the Northern Terminal Siting Area.

<u>Southern Terminal</u>

No LWCs were identified within the Southern Terminal Siting Area.

<u>Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub</u>

The design option involves modifications of proposed transmission facilities that would apply to all alternatives. Differences between this design option and the Proposed Project include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between the IPP and Marketplace. The southern converter station would be located near the IPP in Utah instead of at the Marketplace in Nevada and the ground electrode system would be within 50 miles of the IPP. Under Design Option 2, the transmission line would be AC from Southern Terminal Siting Area near the IPP to the Marketplace Hub in Nevada.


SUBLETTE
FREMONT
LANDER F.O.
Separation Flats
Eight Mile Basin
RAWLINS F.O.
Separation Creek
SWEETWATER
ROCK SPRINGS F.O.
CARBON
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Adobe Town WSA
Shell Creek
Medicine Bow-Routt National Forest
Fivemile Point South Alternative Connector
Rotten Springs
WYOMING
UTAH
COLORADO
Baggs Alternative Connector
DAGGETT
Snake East
Little Snake West
LITTLE SNAKE F.O.
JACKSON
MOFFAT
ROUTT
KREMMLING F.O.
VERNAL F.O.
UINTAH
GRAND
WHITE RIVER F.O.
RIO BLANCO
White River National Forest
COLORADO RIVER VALLEY F.O.
Oil Spring Mountain WSA
Bitter Creek
GARFIELD
EAGLE
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
BLM Field Office Boundary
National Forest Boundary
Special Designation Area
Wilderness Study Area
Proposed Wilderness
Wilderness
Lands with Wilderness Characteristics
Actively Undergoing Inventory
Inventoried, Pending Management Decision
Not Managed for Wilderness Character
Other Special Designation Areas or Lands with Wilderness Characteristics
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.20-1
Region I
Lands with Wilderness Characteristics
Miles
km
1:1,500,000
N
Western AREA POWER ADMINISTRATION
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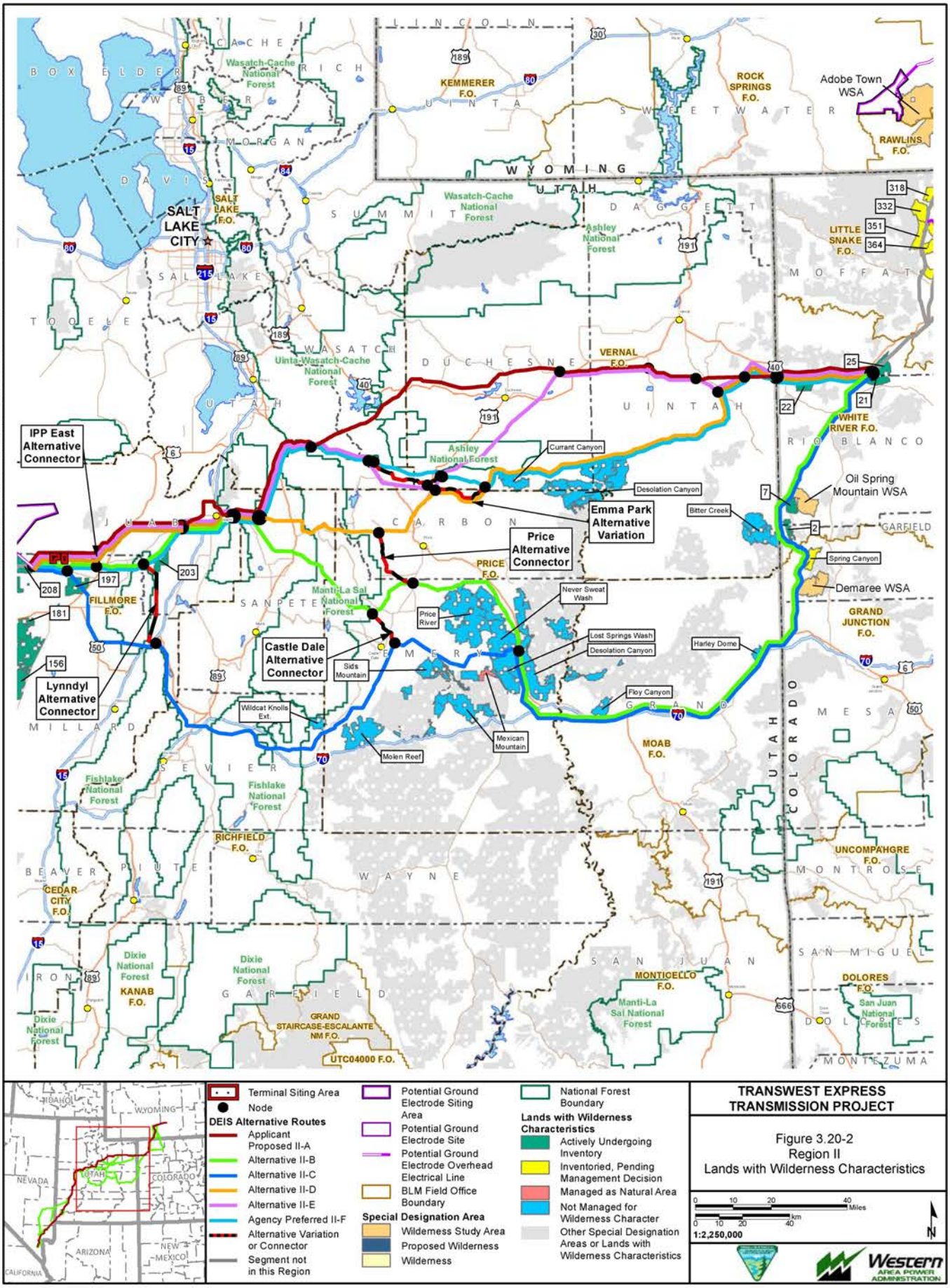
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.20-2
Region II
Lands with Wilderness Characteristics
1:2,250,000
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
BLM Field Office Boundary
Special Designation Area
Wilderness Study Area
Proposed Wilderness
Wilderness
National Forest Boundary
Lands with Wilderness Characteristics
Actively Undergoing Inventory
Inventoried, Pending Management Decision
Managed as Natural Area
Not Managed for Wilderness Character
Other Special Designation Areas or Lands with Wilderness Characteristics
SALT LAKE CITY
IPP East Alternative Connector
Lynndyl Alternative Connector
Castle Dale Alternative Connector
Price Alternative Connector
Emma Park Alternative Variation
Currant Canyon
Desolation Canyon
Bitter Creek
Oil Spring Mountain WSA
Spring Canyon
Demaree WSA
Never Sweat Wash
Price River
Lost Springs Wash
Desolation Canyon
Harley Dome
Floy Canyon
Sids Mountain
Wildcat Knolls Ext.
Molen Reef
Mexican Mountain
Adobe Town WSA
Exported On: 4/19/2013

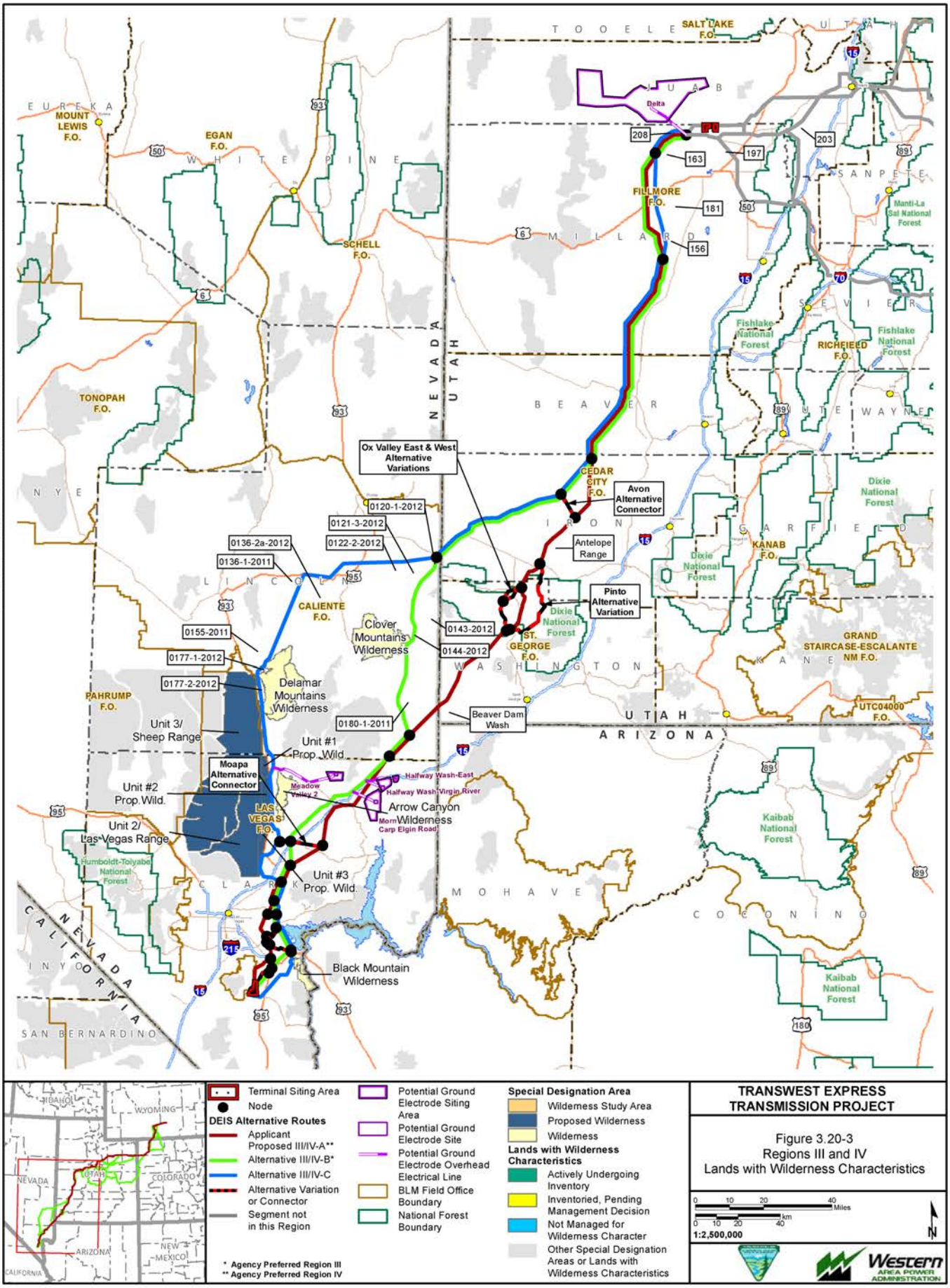
SALT LAKE F.O.
MOUNT LEWIS F.O.
EGAN F.O.
SCHELL F.O.
TONOPAH F.O.
FILLMORE F.O.
RICHFIELD F.O.
CEDAR CITY F.O.
KANAB F.O.
ST. GEORGE F.O.
CALIENTE F.O.
PAHRUMP F.O.
LAS VEGAS F.O.
GRAND STAIRCASE-ESCALANTE NM F.O.
UTC04000 F.O.
Ox Valley East & West Alternative Variations
Avon Alternative Connector
Antelope Range
Pinto Alternative Variation
Beaver Dam Wash
Clover Mountains Wilderness
Delamar Mountains Wilderness
Unit 3/ Sheep Range
Unit #1 Prop. Wild.
Unit #2 Prop. Wild.
Unit 2/ Las Vegas Range
Unit #3 Prop. Wild.
Moapa Alternative Connector
Arrow Canyon Wilderness
Black Mountain Wilderness
Halfway Wash-East
Halfway Wash-Virgin River
Meadow Valley 2
Carp Elgin Road
0120-1-2012
0121-3-2012
0122-2-2012
0136-2a-2012
0136-1-2011
0155-2011
0177-1-2012
0177-2-2012
0180-1-2011
0143-2012
0144-2012
Delta
Manti-La Sal National Forest
Fishlake National Forest
Dixie National Forest
Humboldt-Toiyabe National Forest
Kaibab National Forest
UTAH
NEVADA
ARIZONA
CALIFORNIA
Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed III/IV-A**
Alternative III/IV-B*
Alternative III/IV-C
Alternative Variation or Connector
Segment not in this Region
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
BLM Field Office Boundary
National Forest Boundary
Special Designation Area
Wilderness Study Area
Proposed Wilderness
Wilderness
Lands with Wilderness Characteristics
Actively Undergoing Inventory
Inventoried, Pending Management Decision
Not Managed for Wilderness Character
Other Special Designation Areas or Lands with Wilderness Characteristics
* Agency Preferred Region III
** Agency Preferred Region IV
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.20-3
Regions III and IV
Lands with Wilderness Characteristics
1:2,500,000
Western AREA POWER ADMINISTRATION
Exported On: 6/5/2013
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Table 3.20-1 Lands with Wilderness Characteristics Inventory Units in the Analysis Area

Region	Field Office	Unit ID/Name	Unit Size (Acres)	Sufficient Size	Naturalness	Solitude	Primitive and Unconfined Recreation	Supplemental Values	Approved RMP Decisions
I	Rawlins	WY-030-13N95W24-2012 - Rotten Springs	6,105	Y	Y	N	Y	N	N
I	Little Snake	332	10,984	Y	Y	Y	Y	Y	N*
I	Little Snake	118	5,356	Y	Y	Y	Y	Y	N*
I	Little Snake	353	6,323	Y	Y	Y	Y	Y	N*
I	Little Snake	351	9,762	Y	Y	Y	Y	Y	N*
I	Little Snake	364	6,923	Y	Y	Y	Y	Y	N*
I	Little Snake	406	11,485	Y	Y	Y	Y	Y	N*
I	Little Snake	407	10,970	Y	Y	Y	Y	Y	N*
I	Little Snake	409	6,343	Y	Y	Y	Y	Y	N*
I	Little Snake	291	9,607	Y	Y	Y	Y	N	N*
I	Little Snake	290	7,591	Y	Y	Y	Y	N	N*
I	Little Snake	318	6,373	Y	Y	N	Y	Y	N*
I	Little Snake	274	6,932	Y	Y	Y	Y	Y	N*
I	Little Snake	509	14,521	Y	Y	Y	Y	Y	N*
I	White River	25	9,567	Y	Y	Y	Y	N	N*
II	White River	2	5,205	Y	Y	Y	Y	Y	N*
II	White River	21	9,021	Y	Y	Y	Y	Y	N*
II	White River	22	9,376	Y	Y	Y	Y	Y	N*
II	White River	7	8,370	Y	Y	Y	Y	Y	N*
II	Grand Junction	Spring Canyon	8,831	Y	Y	Y	Y	N	N
II	Vernal	Bitter Creek	33,488	Y	Y	Y	Y	N	Y – not managed for LWC
II	Vernal	Currant Canyon	14,434	Y	Y	Y	Y	N	Y – not managed for LWC
II	Vernal/Price	Desolation Canyon	170,606	Y	Y	Y	Y	N	Y – not managed for LWC
II	Moab	Floy Canyon	9,983	Y	Y	Y	Y	N	Y – not managed for LWC
II	Moab	Harley Dome	5,304	Y	Y	Y	Y	N	Y – not managed for LWC
II	Price	Lost Springs Wash	32,104	Y	Y	N	Y	N	Y – not managed for LWC

Table 3.20-1 Lands with Wilderness Characteristics Inventory Units in the Analysis Area

Region	Field Office	Unit ID/Name	Unit Size (Acres)	Sufficient Size	Naturalness	Solitude	Primitive and Unconfined Recreation	Supplemental Values	Approved RMP Decisions
II	Price	Mexican Mountain	40,955	Y	Y	Y	Y	N	Y – manage only 4,200 acres as natural area; remainder not managed for LWC
II	Price	Molen Reef	33,281	Y	Y	Y	Y	N	Y – not managed for LWC
II	Price	Never Sweat Wash	29,162	Y	Y	N	Y	N	Y – not managed for LWC
II	Price	Price River	89,059	Y	Y	Y	Y	N	Y – not managed for LWC
II	Price	Sids Mountain	34,592	Y	Y	Y	Y	N	Y – not managed for LWC
II	Price	Wildcat Knolls Ext.	7,003	Y	Y	Y	Y	N	Y – not managed for LWC
II	Fillmore	197	13,517	Y	Y	Y	Y	N	N*
II	Fillmore	203	10,219	Y	Y	Y	Y	N	N*
III	Fillmore	156	27,421	Y	Y	Y	Y	N	N*
III	Fillmore	163	8,597	Y	Y	Y	Y	N	N*
III	Fillmore	181	58,282	Y	Y	Y	Y	N	N*
III	Fillmore	208	27,236	Y	Y	Y	Y	N	N*
III	St. George	Beaver Dam Wash	22,277	Y	Y	Y	Y	N	N
III	Cedar City	UT-040-037A - Antelope Range	5,928	Y	Y	Y	Y	N	N
III	Caliente	NV-040-0120-1-2012	9,106	Y	Y	Y	Y	Y	N
III	Caliente	NV-040-0121-3-2012	41,962	Y	Y	Y	Y	Y	N
III	Caliente	NV-040-0122-2-2012	19,870	Y	Y	Y	Y	N	N
III	Caliente	NV-040-0136-1-2011	12,921	Y	Y	Y	N	Y	N
III	Caliente	NV-040-0136-2a-2012	79,032	Y	Y	Y	Y	Y	N
III	Caliente	NV-040-0143-2012	25,778	Y	Y	Y	Y	Y	N
III	Caliente	NV-040-0144-2012	57,999	Y	Y	Y	Y	Y	N
III	Caliente	NV-040-0155-2011	45,786	Y	Y	Y	N	Y	N
III	Caliente	NV-040-0177-1-2012	2,522	Y	Y	Y	Y	N	N
III	Caliente	NV-040-0177-2-2012	6,058	Y	Y	Y	Y	N	N
III	Caliente	NV-040-0180-1-2011	35,519	Y	Y	Y	N	Y	N

* LWC units in the Little Snake, White River, and Fillmore FOs are actively undergoing inventory; however, preliminary inventory information has been used in this analysis.

The relocated Southern Terminal Siting Area would comprise 113 acres and would be located on BLM lands directly adjacent to the IPP in Millard County, Utah. Development of a ground electrode siting area would comprise 40 acres and would be located on BLM and State lands in Juab County. The ground electrode siting area and transmission connection associated with Design Option 2 includes 2,685 acres of LWC Unit 208 in the BLM Fillmore FO if development were to occur within the LWC unit boundaries. Portions of Unit 208 would be eliminated from the unit; however, the remaining portions of the unit would continue to meet the wilderness criteria. Other effects to LWCs from Design Option 2 would be the same as described under the transmission line alternatives since the additional components would be located with the transmission line footprint analyzed.

Design Option 3 – Phased Build Out

The design option involves modifications of proposed transmission facilities that would apply to all alternatives. Development of a substation would comprise 75 acres and would be located completely on BLM lands directly adjacent to the IPP within Millard County. The land that would be used for the substation is the same as that would be used for the Southern Terminal Siting Area under Design Option 2. Effects to LWCs from Design Option 3 would be the same as described under the transmission line alternatives since the additional components would be located with the transmission line footprint analyzed. Timing of impacts to LWCs as described under the proposed Project would vary due to construction schedule differences.

3.20.6.2 Impacts Common to All Alternative Routes and Associated Facilities

Inventory units that are determined to meet criteria for LWC could be intersected or include built portions of the proposed Project and, as a result, some remaining portions may no longer meet the criteria for size requirements (greater than 5,000 acres), naturalness, or solitude.

Since Section 201 of FLPMA indicates that the preparation and maintenance of the inventory shall not, itself, change or prevent change of the management or use of public lands, impacts are documented where they would occur to update the inventory and inform decision-making.

3.20.6.3 Region I

Affected LWC units within Region I crossed by proposed transmission route reference lines are listed in **Table 3.20-2**. As additional access roads and facilities are sited within the 2-mile transmission line corridor, additional impacts to LWC units could occur and eliminate portions or the entirety of the unit from meeting LWC criteria.

Table 3.20-2 Impacts to Lands with Wilderness Characteristics in Region I

Alternative	Field Office	Unit ID/Name	Unit Size (Acres)	Units Resulting From Intersection					Remaining Units Meeting LWC Criteria
				Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	
I-A	Little Snake	353	6,323	6,283	40	--	--	--	1
I-A	Little Snake	351	9,762	9,753	9	--	--	--	1
I-A	Little Snake	364	6,923	5,986	936	--	--	--	1
I-A	Little Snake	409	6,343	5,845	498	--	--	--	1
I-A	Little Snake	290	7,591	6,287	1,304	--	--	--	1
I-A	Little Snake	118	5,356	4,912	444	--	--	--	0
I-A	Little Snake	318	6,373	5,790	583	--	--	--	1
I-A	White River	25	9,567	6,244	3,323	--	--	--	1
I-B	Little Snake	353	6,323	5,882	441	--	--	--	1
I-B	Little Snake	406	11,485	10,885	600	--	--	--	1
I-B	Little Snake	407	10,970	8,883	2,067	19	--	--	1

Table 3.20-2 Impacts to Lands with Wilderness Characteristics in Region I

Alternative	Field Office	Unit ID/Name	Unit Size (Acres)	Units Resulting From Intersection					Remaining Units Meeting LWC Criteria
				Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	
I-B	Little Snake	409	6,343	4,891	1,452	--	--	--	0
I-B	Little Snake	290	7,591	6,287	1,304	--	--	--	1
I-B	Little Snake	318	6,373	5,927	446	--	--	--	1
I-B	Little Snake	118	5,356	4,751	605	--	--	--	0
I-B	Rawlins	Rotten Springs	6,105	6,094	11	--	--	--	1
I-B	White River	25	9,567	6,244	3,323	--	--	--	1
I-C	Little Snake	509	14,521	14,168	353	--	--	--	1
I-C	White River	25	9,567	6,244	3,323	--	--	--	1
I-D	Little Snake	353	6,323	5,882	441	--	--	--	1
I-D	Little Snake	406	11,485	10,885	600	--	--	--	1
I-D	Little Snake	407	10,970	8,883	2,067	19	--	--	1
I-D	Little Snake	409	6,343	4,891	1,452	--	--	--	0
I-D	Little Snake	290	7,591	6,287	1,304	--	--	--	1
I-D	Little Snake	318	6,373	5,927	446	--	--	--	1
I-D	Little Snake	118	5,356	4,751	605	--	--	--	0
I-D	White River	25	9,567	6,244	3,323	--	--	--	1
LS-West Electrode Bed, I-A	Little Snake	353	6,323	6,223	40	32	28	--	1
LS-West Electrode Bed, I-A	Little Snake	406	11,485	8,666	2,224	595	--	--	1
LS-West Electrode Bed, I-A	Little Snake	118	5,356	4,490	444	326	90	7	0
LS-West Electrode Bed, I-B and I-D	Little Snake	118	5,356	4,751	597	8	--	--	0
LS-West Electrode Bed, I-B and I-D	Little Snake	353	6,323	5,882	409	32	--	--	1
LS-West Electrode Bed, I-B and I-D	Little Snake	406	11,485	8,066	2,224	600	595	--	1

Alternative I-A (Applicant Proposed)

Alternative I-A would affect 8 LWC units and would eliminate one unit (Little Snake Unit 118 totaling 5,356 acres) from meeting the LWC criteria. Of the affected units, there would be 7 units remaining totaling 46,188 acres that would continue to meet the LWC criteria, but 7 portions totaling 6,693 acres would be eliminated. Since the 7 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative I-B

Alternative I-B would affect 9 LWC units and would eliminate 2 units (Little Snake Unit 409 totaling 6,343 acres and Little Snake Unit 118 totaling 5,356 acres) from meeting the LWC criteria. Of the affected units, there would be 7 areas remaining totaling 50,202 acres that would continue to meet the LWC criteria and 8 portions of the units totaling 8,211 acres that would be eliminated. Since the 7 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative I-C

Alternative I-C would affect 2 LWC units and would not eliminate any units from meeting the LWC criteria. Of the affected units, there would be 2 areas remaining totaling 20,412 acres that would continue to meet the LWC criteria and 2 portions of the units totaling 3,676 acres that would be eliminated. Since the

2 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative I-D (Agency Preferred)

Alternative I-D would affect 8 LWC units and eliminate 2 units (Little Snake Unit 409 totaling 6,343 acres and Little Snake Unit 118 totaling 5,356 acres) from meeting LWC criteria. Of the affected units, there would be 6 areas remaining totaling 44,108 acres that would continue to meet the LWC criteria and 7 portions of the units totaling 8,200 acres that would be eliminated. Since the 6 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

There are no LWC units near the Tuttle Easement micro-siting options; therefore, impacts would be the same as described for Alternative I-D.

Alternative Ground Electrode Systems in Region I

The conceptual location for the Little Snake West electrode bed and associated transmission connection would affect three LWC units (118, 353, and 406). The electrode bed siting area is located within Unit 406 and all affected units would be crossed by the associated transmission connection.

With connection of the Little Snake West electrode bed to Alternative I-A, all of Unit 118 (totaling 5,356 acres) as well as portions of Units 353 and 406 (totaling 2,919 acres) would be eliminated. Since the remaining portions of Unit 353 (6,323 acres) and Unit 406 (8,666 acres) would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

With connection of the Little Snake West electrode bed to Alternatives I-B and I-D, all of Unit 118 (totaling 5,356 acres) as well as portions of Units 353 and 406 (totaling 3,860 acres) would be eliminated. Since the remaining portions of Unit 353 (5,882 acres) and Unit 406 (8,066 acres) would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Region I Conclusion

Alternative I-B would affect the most LWC units (8) while Alternative I-C would affect the least (2). Alternatives I-A, I-B, and I-D would eliminate Little Snake Unit 118, while Alternatives I-B and I-D also would eliminate Little Snake Unit 409.

3.20.6.4 Region II

Affected LWC units within Region II crossed by proposed transmission route reference lines are listed in **Table 3.20-3**. As additional access roads and facilities are sited within the 2-mile transmission line corridor, additional impacts to LWC units could occur and eliminate portions or the entirety of the unit from meeting LWC criteria.

Table 3.20-3 Impacts to Lands with Wilderness Characteristics in Region II

Alternative	Field Office	Unit ID/Name	Unit Size (Acres)	Units Resulting From Intersection							Remaining Units Meeting LWC Criteria
				Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	
II-A	Fillmore	208	27,236	16,555	10,682	--	--	--	--	--	2
II-A	White River	22	13,049	12,726	321	2	--	--	--	--	1

Table 3.20-3 Impacts to Lands with Wilderness Characteristics in Region II

Alternative	Field Office	Unit ID/Name	Unit Size (Acres)	Units Resulting From Intersection							Remaining Units Meeting LWC Criteria
				Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	
II-B	Fillmore	203	10,219	9,832	364	23	--	--	--	--	1
II-B	Fillmore	208	27,236	16,674	10,520	42	--	--	--	--	2
II-B	Moab	Floy Canyon	9,983	8,994	786	203	--	--	--	--	1
II-B	Moab	Harley Dome	5,304	4,941	207	156	--	--	--	--	0
II-B	Price	Never Sweat Wash	29,162	29,113	49	--	--	--	--	--	1
II-B	Price	Price River	89,059	88,798	148	113	--	--	--	--	1
II-B	White River	21	9,021	8,579	356	87	--	--	--	--	1
II-B	White River	7	8,370	7,699	548	123	--	--	--	--	1
II-C	Fillmore	197	13,517	9,140	4,377	--	--	--	--	--	1
II-C	Fillmore	208	27,236	16,674	10,520	42	--	--	--	--	2
II-C	Moab	Floy Canyon	9,983	8,994	786	203	--	--	--	--	1
II-C	Moab	Harley Dome	5,304	4,941	207	156	--	--	--	--	0
II-C	Price	Lost Springs Wash	32,104	31,992	112	--	--	--	--	--	1
II-C	Price	Never Sweat Wash	29,162	28,245	736	181	--	--	--	--	1
II-C	White River	21	9,021	8,579	356	87	--	--	--	--	1
II-C	White River	7	8,370	7,699	584	123	--	--	--	--	1
II-D	Fillmore	208	27,236	16,555	10,682	--	--	--	--	--	2
II-D	Vernal	Currant Canyon	14,434	14,262	173	--	--	--	--	--	1
II-D	Vernal	Desolation Canyon-2	170,606	170,224	328	13	9	7	2	2	1
II-D	White River	22	13,049	12,726	321	2	--	--	--	--	1
II-E	Fillmore	208	27,236	16,555	10,682	--	--	--	--	--	2
II-E	White River	22	13,049	12,726	321	2	--	--	--	--	1
II-F	Fillmore	203	10,219	9,832	364	23	--	--	--	--	1
II-F	Fillmore	208	27,236	16,674	10,520	42	--	--	--	--	2
II-F	Vernal	Currant Canyon	14,434	14,262	173	--	--	--	--	--	1
II-F	Vernal	Desolation Canyon	170,606	170,244	328	13	9	7	2	2	1
II-F	White River	22	13,049	12,726	321	2	--	--	--	--	1
Lynndyl Alt Con	Fillmore	203	10,219	10,157	62	--	--	--	--	--	1

Alternative II-A (Applicant Proposed)

Alternative II-A would affect 2 LWC units and would not eliminate any units from meeting the LWC criteria. Of the affected units, there would be 3 areas remaining totaling 39,962 acres that would continue to meet the LWC criteria and 2 portions of the units totaling 323 acres that would be eliminated. Since the 3 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

There are no LWC units near the Strawberry IRA micro-siting options; therefore, impacts would be same as described for Alternative II-A.

Alternative II-B

Alternative II-B would affect 8 LWC units and would eliminate 1 unit (Harley Dome in Moab totaling 5,304 acres) from meeting the LWC criteria. Of the affected units, there would be 8 areas remaining totaling 180,209 acres that would continue to meet the LWC criteria and 12 portions of the units totaling 2,841 acres that would be eliminated. Since the 8 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative II-C

Alternative II-C would affect 8 LWC units and would eliminate 1 unit (Harley Dome in Moab totaling 5,304 acres) from meeting the LWC criteria. Of the affected units, there would be 8 areas remaining totaling 121,843 acres that would continue to meet the LWC criteria and 11 portions of the units totaling 7,550 acres that would be eliminated. Since the 8 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative II-D

Alternative II-D would affect 4 LWC units and would not eliminate any units from meeting the LWC criteria. Of the affected units, there would be 5 areas remaining totaling 224,448 acres that would continue to meet the LWC criteria and 9 portions of the units totaling 857 acres that would be eliminated. Since the 5 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative II-E

Alternative II-E would affect 2 LWC units and would not eliminate any units from meeting the LWC criteria. Of the affected units, there would be 3 areas remaining totaling 39,962 acres that would continue to meet the LWC criteria and 2 portions of the units totaling 323 acres that would be eliminated. Since the 3 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative II-F (Agency Preferred)

Alternative II-F would affect 5 LWC units and would not eliminate any units from meeting the LWC criteria. Of the affected units, there would be 6 areas remaining totaling 234,258 acres that would continue to meet the LWC criteria and 12 portions of units totaling 1,286 acres that would be eliminated. Since the 6 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

There are no LWC units near the Cedar Knoll IRA micro-siting options; therefore, impacts would be the same as described for Alternative II-F.

Alternative Variation in Region II

Emma Park Alternative Variation

There are no LWC units in the vicinity of this alternative variation; therefore, no impacts to LWCs would be anticipated with this alternative variation.

Alternative Connectors in Region II

The Lynndyl Alternative Connector would affect one LWC unit (Fillmore Unit 203). Approximately 62 acres would be eliminated from the unit, but the remaining 10,157 acres would continue to meet the LWC criteria.

Since the remaining unit would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

There are no LWC units in the vicinity of the Highway 191 Alternative Connector; therefore, no impacts to LWCs would be anticipated with this alternative connector.

Region II Conclusion

Alternatives II-B and II-C would affect the most LWC units (8) and Alternatives II-A and II-E would affect the least (2). Alternatives II-B and II-C would both eliminate one LWC unit (Harley Dome in Moab).

3.20.6.5 Region III

Affected LWC units within Region III crossed by proposed transmission route reference lines are listed in **Table 3.20-4**. As additional access roads and facilities are sited within the 2-mile transmission line corridor, additional impacts to LWC units could occur and eliminate portions or the entirety of the unit from meeting LWC criteria.

Table 3.20-4 Impacts to Lands with Wilderness Characteristics in Region III

Alternative	Field Office	Unit ID/Name	Unit Size (Acres)	Units Resulting From Intersection						Remaining Units Meeting LWC Criteria
				Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	
III-A	Fillmore	156	27,421	26,953	468	--	--	--	--	1
III-A	Fillmore	208	27,236	16,674	10,520	42	--	--	--	2
III-B	Caliente	0120-1-2012	9,108	4,878	4,229	--	--	--	--	0
III-B	Caliente	0121-3-2012	44,231	42,174	1,796	261	--	--	--	1
III-B	Caliente	0144-2012	58,024	39,547	18,254	206	8	7	3	2
III-B	Caliente	0180-1-2011	35,536	33,808	1,395	215	59	58	1	1
III-B	Fillmore	156	27,421	26,953	468	--	--	--	--	1
III-B	Fillmore	208	27,236	16,674	10,520	42	--	--	--	2
III-C	Caliente	0120-1-2012	9,108	8,994	114	--	--	--	--	1
III-C	Caliente	0121-3-2012	44,231	36,346	7,886	--	--	--	--	2
III-C	Caliente	0122-2-2012	19,883	18,376	1,387	121	--	--	--	1
III-C	Caliente	0155-2011	45,894	45,875	13	6	--	--	--	1
III-C	Caliente	0177-1-2012	2,528	2,337	185	6	--	--	--	1
III-C	Caliente	0177-2-2012	6,072	5,555	462	54	--	--	--	1
III-C	Fillmore	156	27,421	22,196	5,158	67	--	--	--	2
III-C	Fillmore	181	58,282	57,375	908	--	--	--	--	1
III-C	Fillmore	208	27,236	16,674	10,520	42	--	--	--	2

Alternative III-A (Applicant Proposed)

Alternative III-A would affect 2 LWC units and would not eliminate any units from meeting the LWC criteria. Of the affected units, there would be 3 areas remaining totaling 54,147 acres that would continue to meet the LWC criteria and 2 portions of units totaling 510 acres that would be eliminated. Since the 3 remaining

units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative III-B (Agency Preferred)

Alternative III-B would affect 6 LWC units and eliminate 1 unit (Caliente Unit 0120-1-2012) totaling 9,108 acres from meeting the LWC criteria. Of the affected units, there would be 7 areas remaining totaling 187,931 acres that would continue to meet the LWC criteria and 13 portions of the units totaling 4,518 acres that would be eliminated. Since the 7 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative III-C

Alternative III-C would affect 9 LWC units and would not eliminate any units from meeting the LWC criteria. Of the affected units, there would be 12 areas remaining totaling 237,291 acres that would continue to meet the LWC criteria and 12 portions of the units totaling 3,364 acres that would be eliminated. Since the 12 remaining units would be larger than 5,000 acres, it is possible that the LWC criteria for solitude and naturalness would continue to be met in the remaining portions.

Alternative Variations in Region III

There are no LWC units affected by alternative variations in this region.

Alternative Connector in Region III

There are no LWC units affected by alternative connectors in this region.

Alternative Ground Electrode Systems in Region III

There are no LWC units affected by ground electrode beds in this region.

Region III Conclusion

Alternative III-C would affect the most LWC units (9) and Alternative III-A would affect the least. Alternative III-B would eliminate one LWC unit (Caliente Unit 0120-1-2012).

3.20.6.6 Region IV

There are no inventory units that potentially meet LWC criteria within Region IV crossed by proposed or alternative transmission route reference lines.

Alternative Connectors in Region IV

There are no LWC units affected by the alternative connectors in this region.

3.20.6.7 Impacts to LWC from the No Action Alternative

Under the No Action Alternative, the Proposed Project would not be developed. There would be no impacts to LWC units beyond existing conditions and trends.

3.20.6.8 Residual Effects

Since there is no mitigation proposed for impacts to LWC units, residual effects would be the same as the impacts discussed under the action alternatives. Inventory units that are determined to meet criteria for LWC could be intersected or include built portions of the proposed Project and, as a result, some remaining portions may no longer meet the criteria for size requirements (greater than 5,000 acres), naturalness, or solitude.

3.20.6.9 Irreversible and Irretrievable Commitments of Resources

All operation impacts to the wilderness characteristics of LWC units would be irretrievable until transmission line decommissioning, after which time the wilderness characteristics of LWC units would be reclaimed. However, reclamation activities may have limited success in areas with poor soils, some vegetation communities would take years to reestablish, and some areas may never return to their former vegetation cover and composition. As such, these impacts may represent an irreversible commitment of naturalness in LWC units.

3.20.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

Implementation of the Project would result in the use of some LWC units as ROW corridors. Long-term productivity of the LWC units would be largely unaffected except for areas where reclamation may have limited success.

4.0 Federal Agency Land Use Plan Amendments

This chapter discusses federal agency land use plan amendments associated with the TWE project alternatives proposed in Chapter 2.0 and residual impacts from the project-specific impact analysis in Chapter 3.0.

The approximately 725-mile TWE transmission line between Rawlins, Wyoming, and Las Vegas, Nevada, crosses four states, including public lands administered by 14 BLM FOs and 5 national forests. In areas where mitigation or avoidance could not be applied as determined through the project-specific impact analysis discussed in Chapter 3.0, some aspects of the TWE project would not conform to portions of the administering federal agency's land use plan. In addition, because of the large-scale nature of the TWE project and other RFFAs for transmission projects proposed in similar areas, administering agencies have determined that plan amendments to establish new utility corridors should be evaluated to inform lead agency decision-making.

Both the BLM and USFS land use planning regulations (43 CFR 1610.5 and 36 CFR 219.10) require that site-specific decisions, including authorized uses of land, be consistent with the applicable plan. If a proposed site-specific decision is not consistent with the applicable plan, the responsible official may modify the proposed decision to make it consistent with the plan, reject the proposal, or amend the plan to authorize the action. As a result, amendments of multiple USFS LRMPs and BLM RMPs may be necessary before the project could proceed, if approved. Plan amendments also may be needed for proposed or alternative routes that cross the Dinosaur National Monument or Lake Mead NRA and associated NPS decisions may involve a separate NEPA review.

The BLM and USFS plan amendments are subject to public review and procedures outlined in federal regulations (43 CFR 1610.2-4 and 36 CFR 219.9). Pursuant to these regulations, outreach activities (see Chapter 6.0) were conducted to gather public input on the project and proposed amendments, planning criteria were developed and circulated for use in evaluating the amendments, and an analysis of the plan amendments was incorporated into this EIS. The BLM plan amendment procedures also call for an extended 90-day public review period/objection period of plan amendments issued concurrently with project-specific EISs. The BLM's regulations in 43 CFR 1610 require a concurrent 30-day public protest period and 60-day Governor's Consistency Review of the plan amendments.

For the TWE Project, each potential situation of non-conformance by proposed and alternative routes is identified through a comparison to the respective land use plan. A plan amendment that would allow authorization of the proposed or alternative route is presented as the preferred plan amendment for that situation. Land use planning regulations require that the Draft EIS identify the "preferred alternative," or those plan amendments that best meet multiple use and sustained yield mandates of FLPMA and the NFMA. Plan amendments would only be implemented for any project routes that are finally authorized. The plan amendments are identified in the Draft EIS because proposed BLM land use plan decisions (i.e., plan amendments) are subject to a 90-day Draft EIS public comment period and may be protested or subject to an objection process during the Final EIS phase of the NEPA process, as opposed to implementation decisions (i.e., approving a ROW grant), which may have a 45-day Draft EIS public comment period and may be subject to appeal at the ROD phase of the NEPA process.

The following sections describe the proposed BLM and USFS plan amendments required under each alternative, followed by an analysis of the environmental impacts and planning implications associated with adoption of these amendments. A discussion of the federal agencies affected is provided in Section 1.4.2 in Chapter 1.0 and associated BLM and USFS plans are listed in **Table 1-3** (BLM plans) and **Table 1-4** (USFS plans). The project purpose and need, alternatives, affected environment, and

TWE project-specific impact analysis are discussed in the previous EIS chapters (1.0 through 3.0). Cumulative impacts are addressed in Chapter 5.0.

4.1 Land Use Plan Amendment Process

4.1.1 Bureau of Land Management Planning

The BLM prepares RMPs for public lands and federal minerals in accordance with FLPMA and the regulations in 43 CFR 1600. The BLM Handbook H-1601-1 *Land Use Planning Handbook* provides specific guidance for preparing, amending, revising, maintaining, implementing, monitoring, and evaluating BLM land use plans. According to the BLM Land Use Planning Handbook (H-1601-1), "plan amendments (see 43 CFR 1610.5-5) change one or more of the terms, conditions, or decisions of an approved land use plan" and "are most often prompted by the need to: (1) Consider a proposal or action that does not conform to the plan." The BLM's land use planning regulations at 43 CFR 1610.5-5 state, "an amendment shall be initiated by the need to consider a Proposed Action that may result in a change in the scope of resources uses or a change in the terms, conditions, and decisions of the approved plan." Plans needing amendment may be grouped geographically or by type of decision in the same amendment process. Similarly, one amendment process may amend the same or related decisions in more than one land use plan. The amendment process also may be used to update plans adopted from another agency (H-1601-1).

4.1.2 U.S. Forest Service Planning

The USFS prepares LRMPs in accordance with NFMA and the regulations in 36 CFR 219. The USFS direction for plan development, plan amendment, or plan revision is provided in the Forest Service Manual (FSM) 1920 *Land Management Planning* Section or Forest Service Handbook (FSH) 1909.12 *Land Management Planning Handbook* Chapter. The USFS land use planning regulations at 36 CFR 219.8 state, "a plan amendment may add, modify, or rescind one or more of the decisions of a plan (§219.7). An amendment decision must be based on the identification and consideration of issues (§219.4), applicable information (§219.5), and an analysis of the effects of the proposed amendment (§219.6). In developing an amendment, the responsible official must provide opportunities for collaboration consistent with §219.12 through §219.18." The USFS recently revised their planning rule, which was published in the *Federal Register* on April 9, 2012, and includes a 60-day objection process (detailed in Subpart B of the final planning rule).

4.2 Planning Area Boundaries

Since the plan amendments needed to bring the proposed or alternative routes into conformance would be limited to the 2-mile transmission line corridor, the planning area boundaries are limited to this area (shown in **Figures 2-1** through **2-4** in Chapter 2.0).

4.3 Planning Issues and Criteria

The NOI to prepare an EIS and associated plan amendments for the TWE Project was published in the *Federal Register* on January 4, 2011, and initiated a 90-day public scoping period. The BLM and Western held 23 public scoping meetings at various locations in Wyoming, Colorado, Utah, and Nevada (see Section 1.7 and **Table 1-5** in Chapter 1.0 for a list of meetings). The planning issues identified in the NOI and through scoping are discussed in Section 4.3.1. General planning criteria were developed based on these issues in relation to areas of non-conformance and are included in Section 4.3.2.

4.3.1 Planning Issues

According to 43 CFR 1610.4-1, at the outset of the planning process, the public, other federal agencies, state and local governments, and Indian tribes shall be given an opportunity to suggest concerns, needs, and resource use, development, and protection opportunities for consideration in analyzing

project impacts and identifying potential plan amendments. The federal land manager, in collaboration with any cooperating agencies, analyzed those suggestions and other available data, such as records of resource conditions, trends, needs, problems, and select topics to determine the issues to be addressed during the planning process. Issues were modified during the planning process to incorporate new information. The identification of issues also complies with the scoping process required by regulations implementing NEPA (40 CFR 1501.7).

The following issues were identified by the BLM and USFS, other agencies, cooperators, and individuals in the January 2011 NOI:

- Socioeconomic impacts;
- Public health and safety;
- Plant and animal species (including special and sensitive status species, desert tortoise and sage-grouse);
- Cultural resources and historic sites;
- Visual intrusions;
- Lands with wilderness characteristics;
- National scenic and historic trails;
- Wild and scenic rivers; and,
- IRAs on national forests.

BLM and USFS invited the public, other federal agencies, and state, local, and Tribal governments to identify additional concerns or issues during scoping meetings and the public comment period that followed. The following nine key topics were identified through public scoping as discussed in Section 1.8:

- Corridor locations;
- Potential private and public land use conflicts;
- Impacts to fish, wildlife, vegetation, special status species, and habitat;
- Public health and safety;
- Impacts to areas with special management designations;
- Cumulative impacts;
- Socioeconomic impacts (property values and tax base);
- Concerns about wildlife mitigation; and
- Noxious weed control and reclamation.

4.3.2 Planning Criteria

Planning criteria guide development of the plan amendment by helping define the decision space (or the "sideboards" that define the scope of the planning effort); they are based upon applicable laws, Director and State Director guidance, and the results of public and governmental participation (43 CFR 1610.4-2). The planning criteria serve the following purposes:

- To ensure that the planning effort is focused on the issues, follows and incorporates legal requirements, addresses management of all land resources and land uses in the planning area, and that preparation is accomplished efficiently;
- To identify the scope and parameters of the planning effort for the decision-maker, the interdisciplinary team and the public; and
- Inform the public of what should and should not be expected from the plan amendment effort. This includes identification of any planning issues that are not ready for decision-making and that will be addressed only through subsequent activity or implementation planning efforts or in approving public land and resource use authorizations (e.g., processing applications for ROWs).

The following general planning criteria were developed for the proposed plan amendments to help focus the preparation of planning and management alternatives and the analysis of impacts and to guide selection of the preferred alternative.

- This planning effort will recognize valid existing rights.
- Actions must comply with laws, executive orders, regulations, and policy.
- Lands covered by the planning effort include any/all lands that may affect, or be affected by, the management occurring on lands in the planning area. However, the plan amendment will apply only to the BLM and USFS-administered lands in the planning area. Within the planning area, management decisions will not apply to non-public land surface or mineral estate, on public lands administered by other federal agencies, or the federal mineral estate underlying public lands administered by other federal agencies.
- A collaborative and multi-jurisdictional approach will be used, where possible, to jointly determine the desired future condition and management direction for the public lands.
- To the extent possible, and within legal and regulatory parameters, management and plan amendment decisions will be consistent with officially approved or adopted resource related plans, and the policies and programs contained therein, of other federal agencies, state and local governments and Indian tribes, so long as the guidance and resource management plans also are consistent with the purposes, policies and programs of federal laws and regulations applicable to federal lands, including federal and state pollution control laws as implemented by applicable federal and state air, water, noise, and other pollution standards or implementation plans.
- Planning and management direction will be focused on the relative values of resources and not the combination of uses that will give the greatest economic return or economic output.
- Where practicable and timely for the plan amendment, current scientific information, research, and new technologies will be considered.

- Existing endangered species recovery plans, including plans for reintroduction of endangered species and other species, will be considered. Consultation, coordination and cooperation with the USFWS will be in accordance with Interagency MOUs regarding Section 7 Consultation. Applicable biological opinions regarding areas within the planning area will be considered.
- Standard Mitigation Guidelines for surface disturbing and disruptive activities will be applied to the analysis and approval of subsequent activities.

The following planning criteria will be used to guide the selection of the plan amendment:

- Levels of land use restrictions or mitigation needed to protect resources and keep lands and resources available for public use;
- Manageability of plan amendment decisions with consideration of jurisdiction, management goals for other resources present, and resource uses in the planning area;
- The potential for the occurrence of mineral and energy resources;
- Consistency with the land use plans, programs, and policies of other federal agencies, state and local governments, and Indian tribes;
- The potential for sustaining the productivity and diversity of ecosystems while providing for human values, products, and services;
- Social and economic values;
- Existing law, regulations, and policy;
- Public welfare and safety; and
- Environmental impacts.

4.4 Proposed Land Use Plan Amendments

Affected federal land managers were contacted in May and June 2011 with follow-up discussions in March 2012 to gather data on whether plan amendments were needed when crossing their jurisdiction. Based on those discussions and conformance considerations resulting from the TWE project impact analysis in Chapter 3.0, areas of potential non-conformance were identified as follows:

- Areas with utility-corridor-only placement restrictions, corridors with underground only restrictions, ROW exclusion areas, or ROW avoidance areas with unavoidable resource conflicts;
- Areas crossing Special Designations or Management Areas (SD/MAs), such as NHTs, ACECs, natural areas, or WSRs, that have ROW corridor restrictions or unavoidable resource conflicts;
- Lack of compliance with resource objectives, stipulations, standards, and guidelines that cannot be avoided or mitigated, which could include areas that encroach on buffers to protect raptors, cultural resources, special status species, water sources, and areas that conflict with recreation or visual quality objectives; and,
- Agency-identified need to amend a plan to expand an existing utility corridor or create a new utility corridor because of the large-scale nature of the TWE project and other RFFA transmission projects proposed in similar areas.

Table 4-1 describes the type of non-conformance issue in each affected jurisdiction per alternative that necessitates a plan amendment for the various BLM FOs and national forests. **Table 4-1** also lists routing issues that were considered, but did not require a plan amendment. Maps depicting with the required plan amendments are included in **Figures 4-1** through **4-19**.

In general, the federal land managers designate utility corridors with the objectives of providing space for infrastructure projects, while minimizing the proliferation of dispersed ROWs across federal lands and the associated environmental impacts. Designation of utility corridors in a land use plan indicates the preferred location for linear ROWs (such as those needed for transmission lines, pipelines and other infrastructure projects) in a particular resource area. Most utility corridors are designated based on the best information available from utilities and government agencies at the time of the plan revision. Many utility corridors have been designated based on the location and type of existing facilities present. However, some of the corridors were never used due to changes in the economy or a variety of other reasons. Other projects were approved outside of designated corridors. Thus, while utility corridors reflect the agency's best efforts to predict future needs, they do occasionally need to be re-evaluated and updated.

Designation of a utility corridor does not mean that future ROWs are necessarily restricted to corridors, nor is it a commitment by the federal land manager to approve all ROW applications within corridors. If the TWE Project and plan amendments are approved, subsequent projects seeking to locate in existing or newly created utility corridors would still be required to undergo additional environmental review pursuant to NEPA. The average number of transmission lines that are placed together in the same corridor is usually two to four lines. However, the corridor could contain other linear facilities, such as pipelines or fiber-optic cables. The ultimate capacity of the corridor for additional facilities would be determined by the federal land manager through review of future NEPA documents, as well as ongoing land use monitoring and management activities.

While the amendments for new utility corridors designate a corridor centered on the TWE reference lines, the width of the corridor may be narrowed or widened in places at the federal land manager's discretion in the future. This may be necessary and appropriate, for example, as a way to avoid disturbing sensitive resources in a particular area. The designated width is considered a general guideline; however, the federal land manager can require proposed utilities to reduce spacing to the extent feasible or avoid sensitive resources within a corridor. This flexibility is desirable as it allows the federal land manager to locate future ROWs and facilities to avoid sensitive resources or other developments.

A description of the non-conformance issues and whether a plan amendment would be needed are described in the following sections.

Table 4-1 Federal Agency Land Use Plan Amendment Considerations and Recommendations[1]

Agency	Office	State	Affected Management Plans	Alternatives Requiring Amendment	Non-conformance Issue	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative Connector	Alternative Variation
BLM	Rawlins FO	Wyoming	ROD and Approved Rawlins RMP (Dec 2008)	A, B, C, D, and Connectors (Mexican Flats, Baggs, Fivemile Point N & S)	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	X	--	--	N/A	N/A	--	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-raptors, cultural, visual[5]	X-raptors, cultural, visual[5]	X-raptors, cultural, water, visual[5]	X-raptors, cultural, visual[5]	N/A	N/A	X-raptors, cultural, water, visual[5]	N/A
					Amendments to Accommodate RFFA Projects	X	X	X	X	N/A	N/A	X	N/A
BLM	Little Snake FO	Colorado	Little Snake ROD and Approved RMP (Oct 2011)	A, B, D	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	--	--	--	N/A	N/A	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-raptors, SSS wildlife, water, visual[5]	X-raptors, SSS wildlife, visual[5]	X-raptors, SSS wildlife, water, visual[5]	X-raptors, SSS wildlife, visual[5]	N/A	N/A	N/A	N/A
					Amendments to Accommodate RFFA Projects	X	X	--	X	N/A	N/A	N/A	N/A
BLM	White River FO	Colorado	White River ROD and Approved RMP (Jul 1997)	B, C	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	X	X	--	--	--	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-raptors	X-visual[4,5], SSS wildlife, raptors	X-visual[4,5], SSS wildlife, raptors	X-raptors	X-raptors	X-raptors	N/A	N/A
					Amendments to Accommodate RFFA Projects	--	X	X	--	--	--	N/A	N/A

Table 4-1 Federal Agency Land Use Plan Amendment Considerations and Recommendations[1]

Agency	Office	State	Affected Management Plans	Alternatives Requiring Amendment	Non-conformance Issue	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative Connector	Alternative Variation
BLM	Grand Junction FO	Colorado	Grand Junction Resource Area RMP and ROD (Jan 1987)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	N/A	--	--	N/A	N/A	N/A	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	N/A	X-SMAs, wildlife, visual[5]	X-SMAs, wildlife, visual[5]	N/A	N/A	N/A	N/A	N/A
					Amendments to Accommodate RFFA Projects	N/A	--	--	N/A	N/A	N/A	N/A	N/A
BLM	Vernal FO	Utah	Vernal FO ROD and Approved RMP (Oct 2008)	A, B, C, D, E, F	Utility Corridor Restriction[2]/ ROW Exclusion Area	X	X	X	X	X	X	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-SSS wildlife, water, visual[5]	X-SSS wildlife, water	X-SSS wildlife, water	X-SSS wildlife, water, SMAs, visual[5]	X-SSS wildlife, water, visual[5]	X-SSS wildlife, water, SMAs, visual[5]	N/A	N/A
					Amendments to Accommodate RFFA Projects	--	--	--	--	--	--	N/A	N/A
BLM	Moab FO	Utah	Moab FO ROD and Approved RMP (Oct 2008)	None	Utility Corridor Restriction[2]/ ROW Exclusion Area	N/A	--	--	N/A	N/A	N/A	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	N/A	X-cultural, minerals, SSS wildlife, water, visual[5]	X-cultural, minerals, SSS wildlife, water, visual[5]	N/A	N/A	N/A	N/A	N/A
					Amendments to Accommodate RFFA Projects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 4-1 Federal Agency Land Use Plan Amendment Considerations and Recommendations[1]

Agency	Office	State	Affected Management Plans	Alternatives Requiring Amendment	Non-conformance Issue	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative Connector	Alternative Variation
BLM	Price FO	Utah	Price FO ROD and Approved RMP (Oct 2008)	B, C	Utility Corridor Restriction[2]/ ROW Exclusion Area	N/A	X	X	--	N/A	N/A	--	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	N/A	X-cultural, water, SSS wildlife	X-SMAs, cultural, water, SSS wildlife, visual[5]	X-water	N/A	N/A	X-water	X-water
					Amendments to Accommodate RFFA Projects	N/A	X	X	--	N/A	N/A	--	--
BLM	Salt Lake FO	Utah	ROD for the Pony Express RMP and Rangeland Program Summary for Utah County (Jan 1990)	F, Emma Park Alternative Variation	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	N/A	N/A	N/A	--	X	N/A	X
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	--	N/A	N/A	N/A	--	--	N/A	--
					Amendments to Accommodate RFFA Projects	--	N/A	N/A	N/A	--	X	N/A	X
BLM	Richfield FO	Utah	Richfield ROD and Approved RMP (Oct 2008)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	--	--	--	--	--	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	--	X-water	X-water	X-water	--	--	N/A	N/A
					Amendments to Accommodate RFFA Projects	--	--	--	--	--	--	N/A	N/A

Table 4-1 Federal Agency Land Use Plan Amendment Considerations and Recommendations[1]

Agency	Office	State	Affected Management Plans	Alternatives Requiring Amendment	Non-conformance Issue	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative Connector	Alternative Variation
BLM	Fillmore FO	Utah	Warm Springs Resource Area RMP and ROD (Apr 1987) House Range Resource Area RMP and ROD (Oct 1987)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	--	--	--	--	--	--	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-visual[5]	--	--	X-visual[5]	X-visual[5]	X-visual[5]	--	N/A
					Amendments to Accommodate RFFA Projects	--	--	--	--	--	--	--	N/A
BLM	Cedar City FO	Utah	Pinyon Management Framework Plan (Jun 1983) Cedar Beaver Garfield Antimony ROD / RMP (Oct 1986)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	--	--	N/A	N/A	N/A	--	--
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	--	X-visual[5]	X-visual[5]	N/A	N/A	N/A	--	--
					Amendments to Accommodate RFFA Projects	--	--	--	N/A	N/A	N/A	--	--
BLM	St. George FO	Utah	Saint George FO ROD and RMP (Mar 1999)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	N/A	N/A	N/A	N/A	N/A	N/A	--
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-SSS wildlife	N/A	N/A	N/A	N/A	N/A	N/A	--
					Amendments to Accommodate RFFA Projects	--	N/A	N/A	N/A	N/A	N/A	N/A	--

Table 4-1 Federal Agency Land Use Plan Amendment Considerations and Recommendations[1]

Agency	Office	State	Affected Management Plans	Alternatives Requiring Amendment	Non-conformance Issue	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative Connector	Alternative Variation
BLM	Caliente FO	Nevada	Ely District Approved RMP (Aug 2008)	C	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	--	X	N/A	N/A	N/A	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-visual[5]	X-visual[5]	X-visual[5]	N/A	N/A	N/A	N/A	N/A
					Amendments to Accommodate RFFA Projects	--	--	--	N/A	N/A	N/A	N/A	N/A
BLM	Las Vegas FO	Nevada	ROD for the Approved Las Vegas RMP and FEIS (Oct 1998)	A, Sunrise Connector	Utility Corridor Restriction[2]/ ROW Exclusion Area	X	--	--	N/A	N/A	N/A	--	X
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-SMAs, Water, visual[5]	X-SMAs, Water, visual[5]	X-visual[5]	N/A	N/A	N/A	--	X-SMAs, visual[5]
					Amendments to Accommodate RFFA Projects	--	--	--	N/A	N/A	N/A	--	--
USFS	Ashley National Forest	Utah	Ashley National Forest LRMP (Nov 1986)	None	Utility Corridor Restriction[2]/ ROW Exclusion Area	N/A	N/A	N/A	N/A	--	--	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	N/A	N/A	N/A	N/A	--	--	N/A	N/A
					Amendments to Accommodate RFFA Projects	N/A	N/A	N/A	N/A	--	--	N/A	N/A

Table 4-1 Federal Agency Land Use Plan Amendment Considerations and Recommendations[1]

Agency	Office	State	Affected Management Plans	Alternatives Requiring Amendment	Non-conformance Issue	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative Connector	Alternative Variation
USFS	Uinta National Forest	Utah	LRMP Uinta National Forest (May 2003)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	N/A	N/A	N/A	--	--	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-riparian, visual[5]	N/A	N/A	N/A	X-riparian, visual[5]	X-riparian, visual[5]	N/A	N/A
					Amendments to Accommodate RFFA Projects	--	N/A	N/A	N/A	--	--	N/A	N/A
USFS	Manti-La Sal National Forest	Utah	LRMP Manti-La Sal National Forest (Nov 1986)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	--	N/A	--	--	--	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-visual[5]	X-visual[5]	N/A	X-visual[5]	X-visual[5]	X-visual[5]	N/A	N/A
					Amendments to Accommodate RFFA Projects	--	--	N/A	--	--	--	N/A	N/A
USFS	Fishlake National Forest	Utah	Fishlake National Forest LRMP (Jun 1986)	C	Utility Corridor Restriction[2]/ ROW Exclusion Area	N/A	--	--	N/A	N/A	N/A	N/A	N/A
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	N/A	X-visual[5]	X-visual[4,5]	N/A	N/A	X-visual	N/A	N/A
					Amendments to Accommodate RFFA Projects	N/A	--	X	N/A	N/A	N/A	N/A	N/A

Table 4-1 Federal Agency Land Use Plan Amendment Considerations and Recommendations[1]

Agency	Office	State	Affected Management Plans	Alternatives Requiring Amendment	Non-conformance Issue	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Alternative Connector	Alternative Variation
USFS	Dixie National Forest	Utah	LRMP for the Dixie National Forest (Sept 1986)	None[6]	Utility Corridor Restriction[2]/ ROW Exclusion Area	--	N/A	N/A	N/A	N/A	N/A	N/A	--
					Lack of Compliance with Resource Objectives, Stipulations, Standards, Guidelines[3]	X-recreation, visual[5]	N/A	N/A	N/A	N/A	N/A	N/A	X-recreation, visual[5]
					Amendments to Accommodate RFFA Projects	--	N/A	N/A	N/A	N/A	N/A	N/A	--

[1] Non-conformance issues identified require a plan amendment before the project could proceed, if approved.

[2] Non-conformance issues related to utility corridors was only identified for agency plans that have restrictions to locating ROWs within corridors or the designated corridor was identified for underground only utilities.

[3] Resource conflicts were identified from affected management plans; however, these issues do not necessarily require a plan amendment as some issues allow exceptions in the current plan.

[4] Non-conformance issues related to visual resources include all areas of VRM Class I and II, VQO Preservation and Retention, or SIO Very High and High.

[5] Areas that would conflict with visual quality objectives were determined through the TWE impact analysis in Section 3.12; however, these areas are designated as VRM Class III, VQO Partial Retention, or SIO Moderate in the current management plan and do not necessarily restrict the proposed use in the current approved plan. Therefore, plan amendments for these conflicts are not necessarily required, but are mitigated as determined by federal land managers.

[6] Through discussions with federal land managers and information considered, it was determined that a plan amendment was not necessary to address the conflicts identified. These resource conflicts could be addressed through other measures, including exceptions, as allowed through the current area plan.

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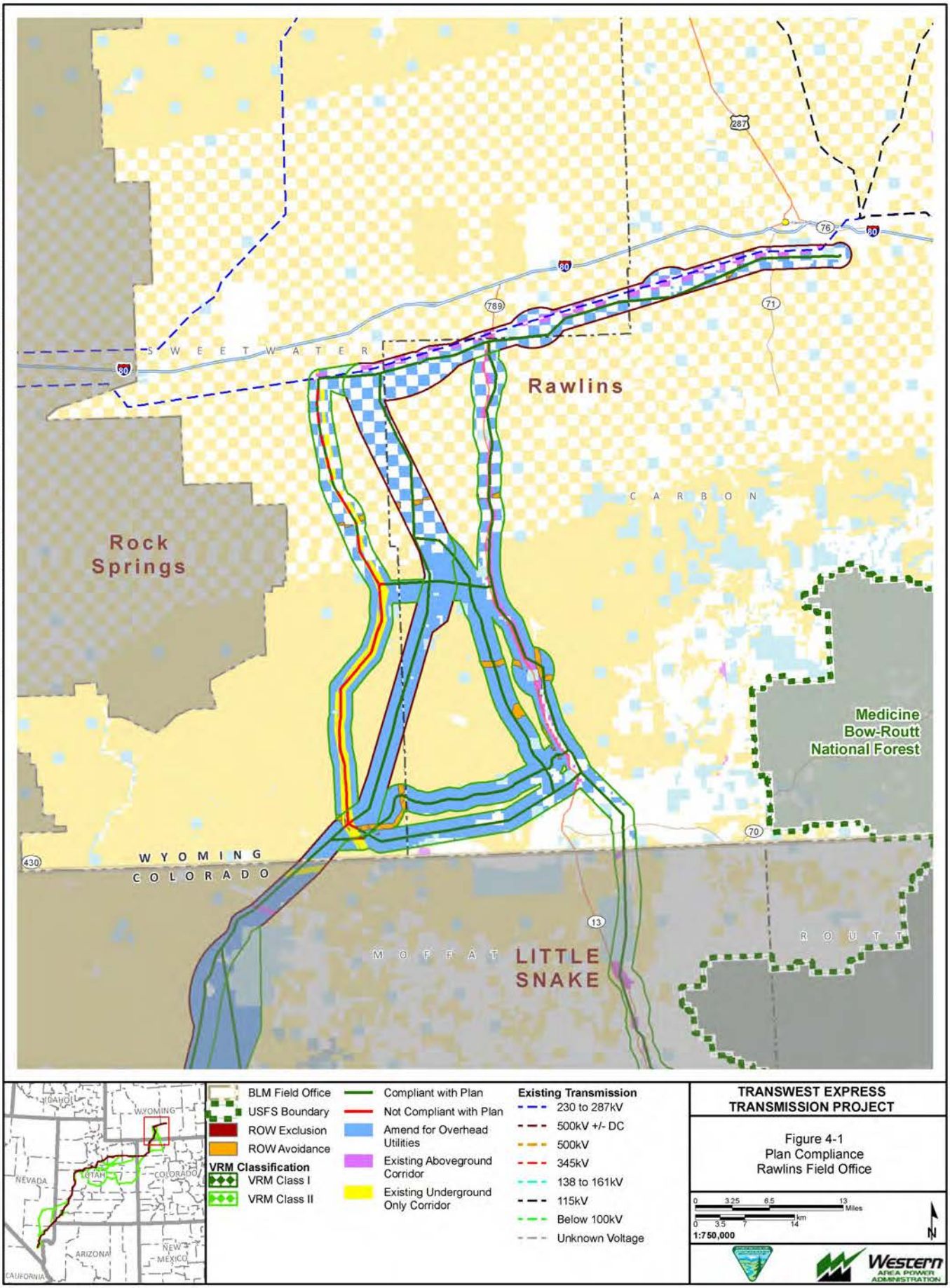

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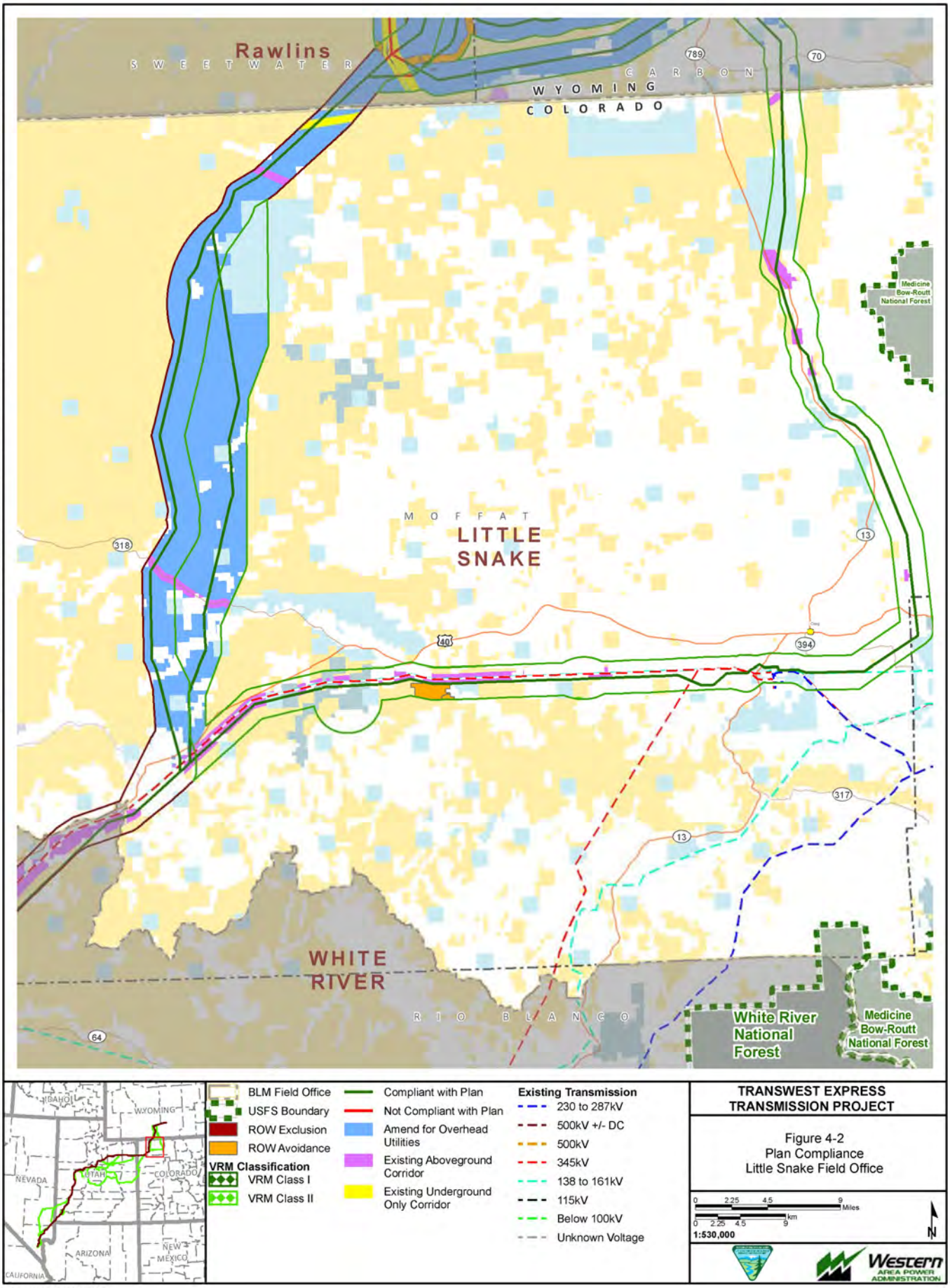

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Figure 4-2
Plan Compliance
Little Snake Field Office

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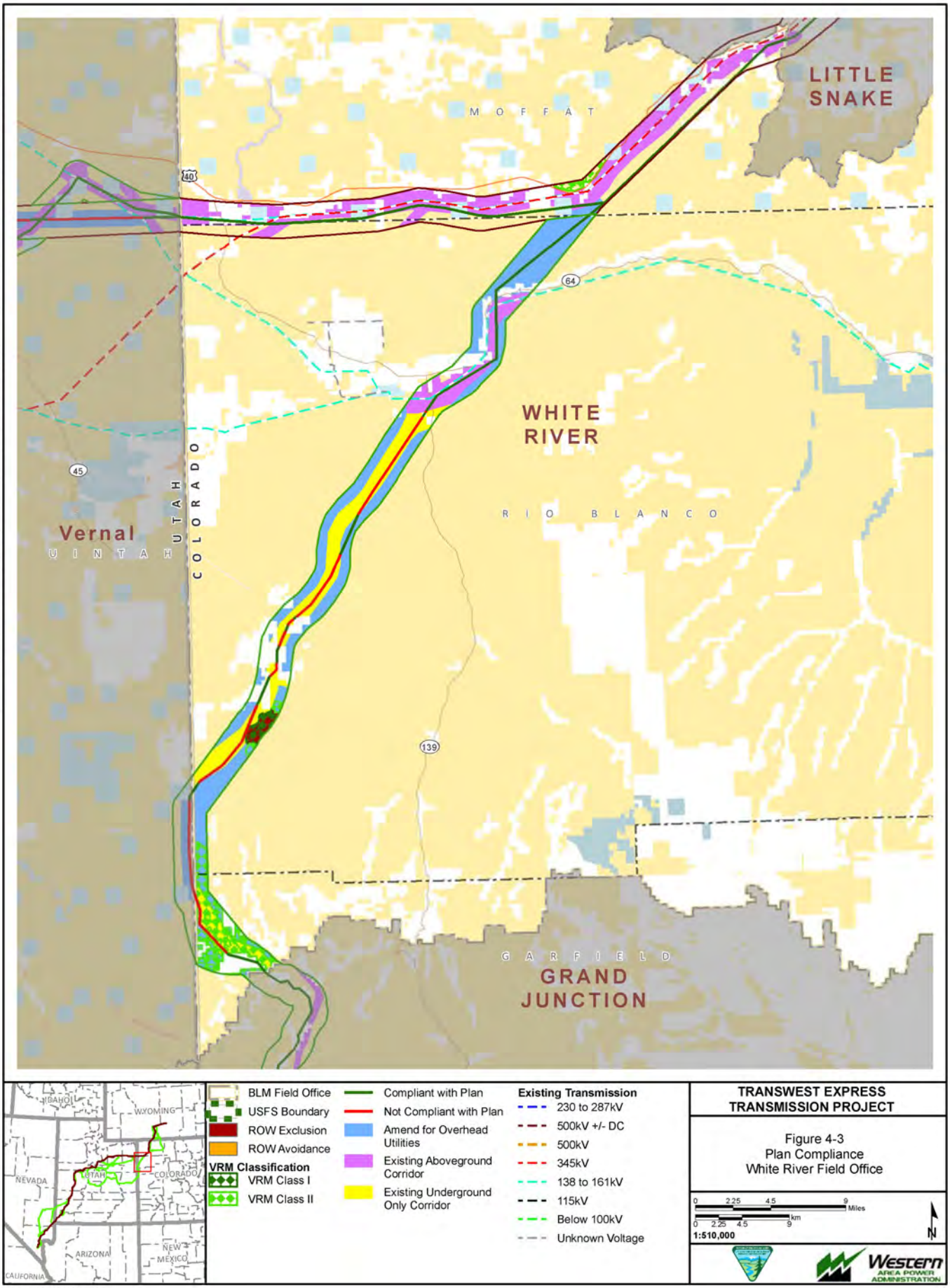

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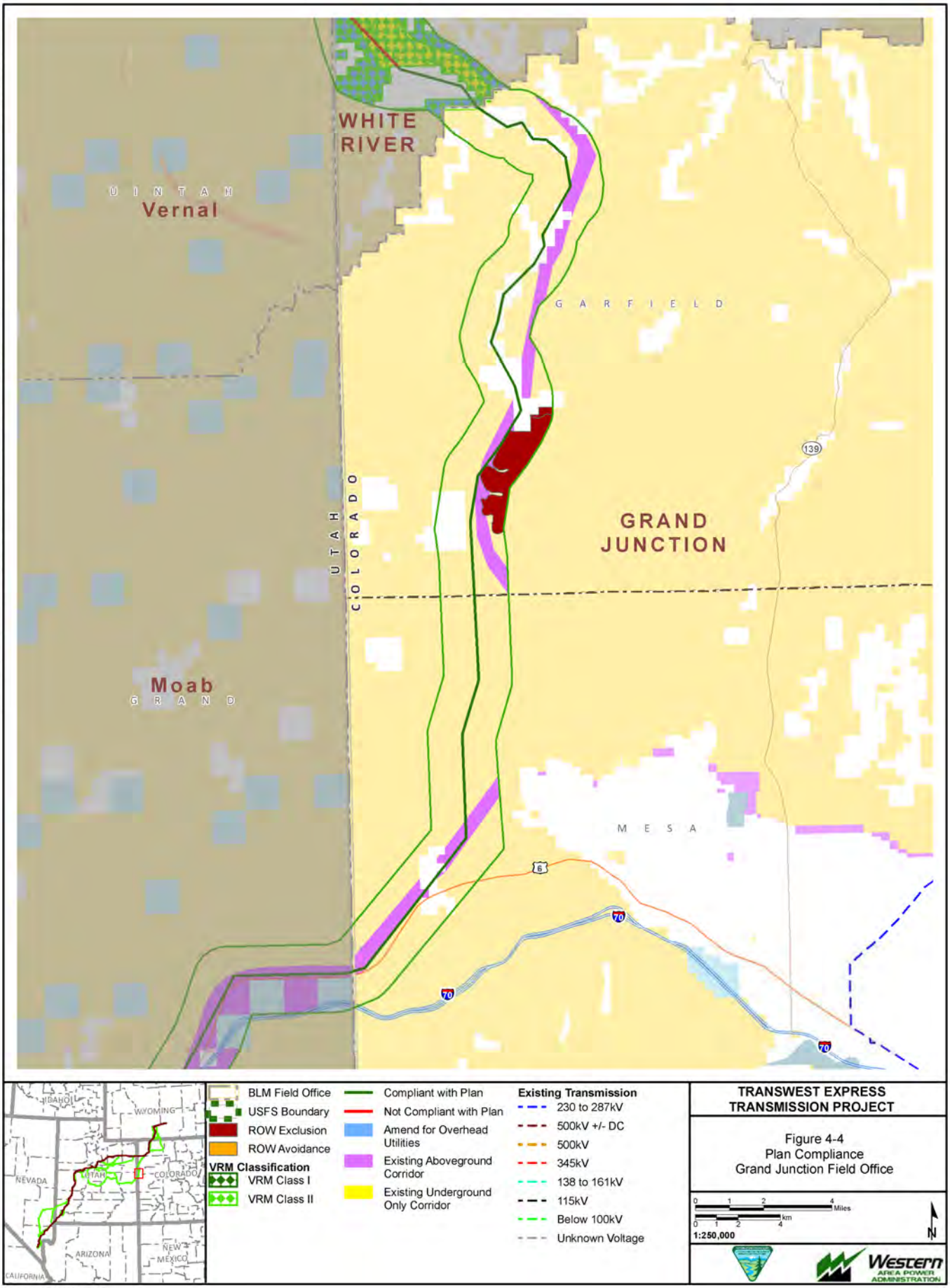

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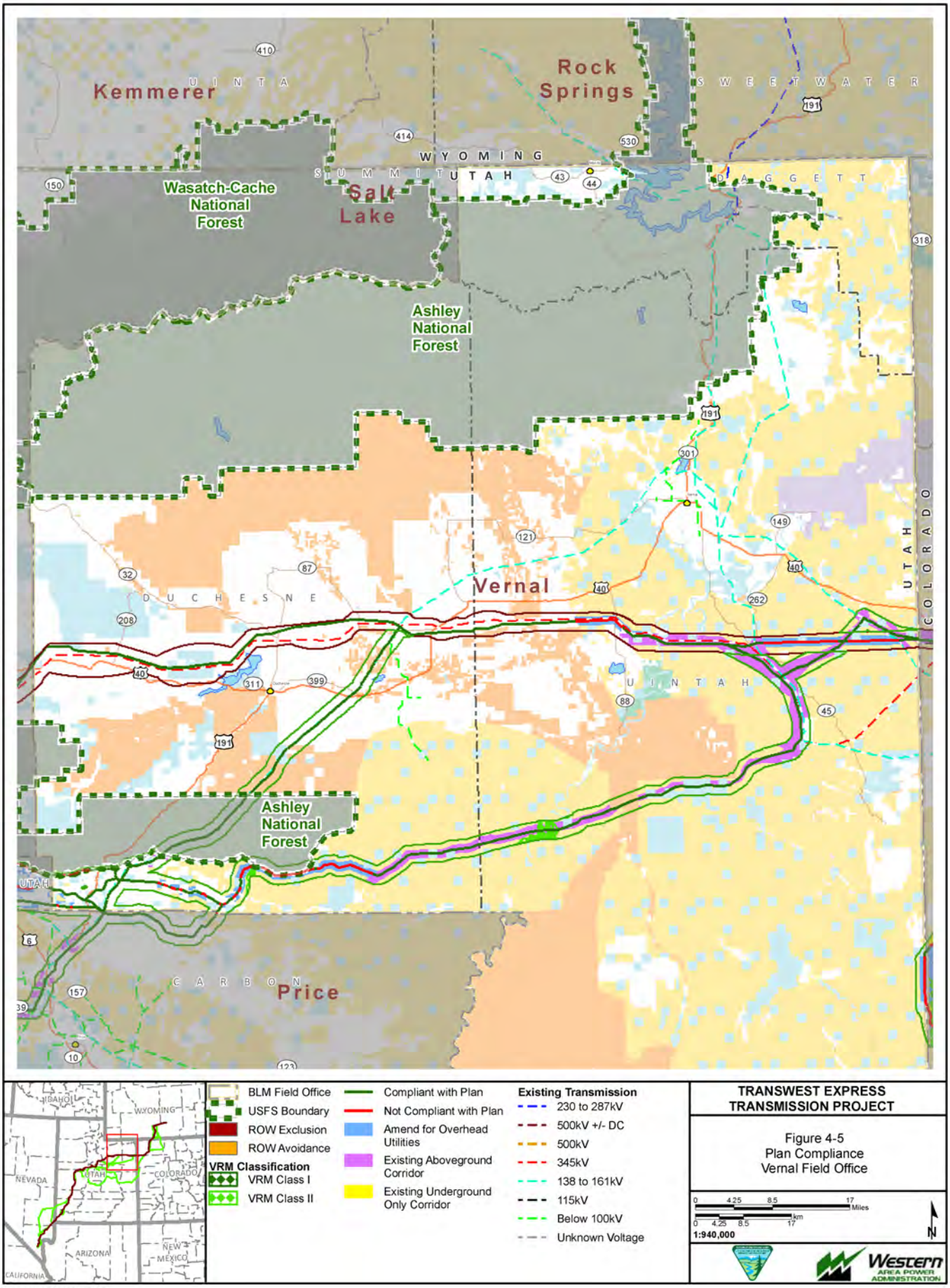

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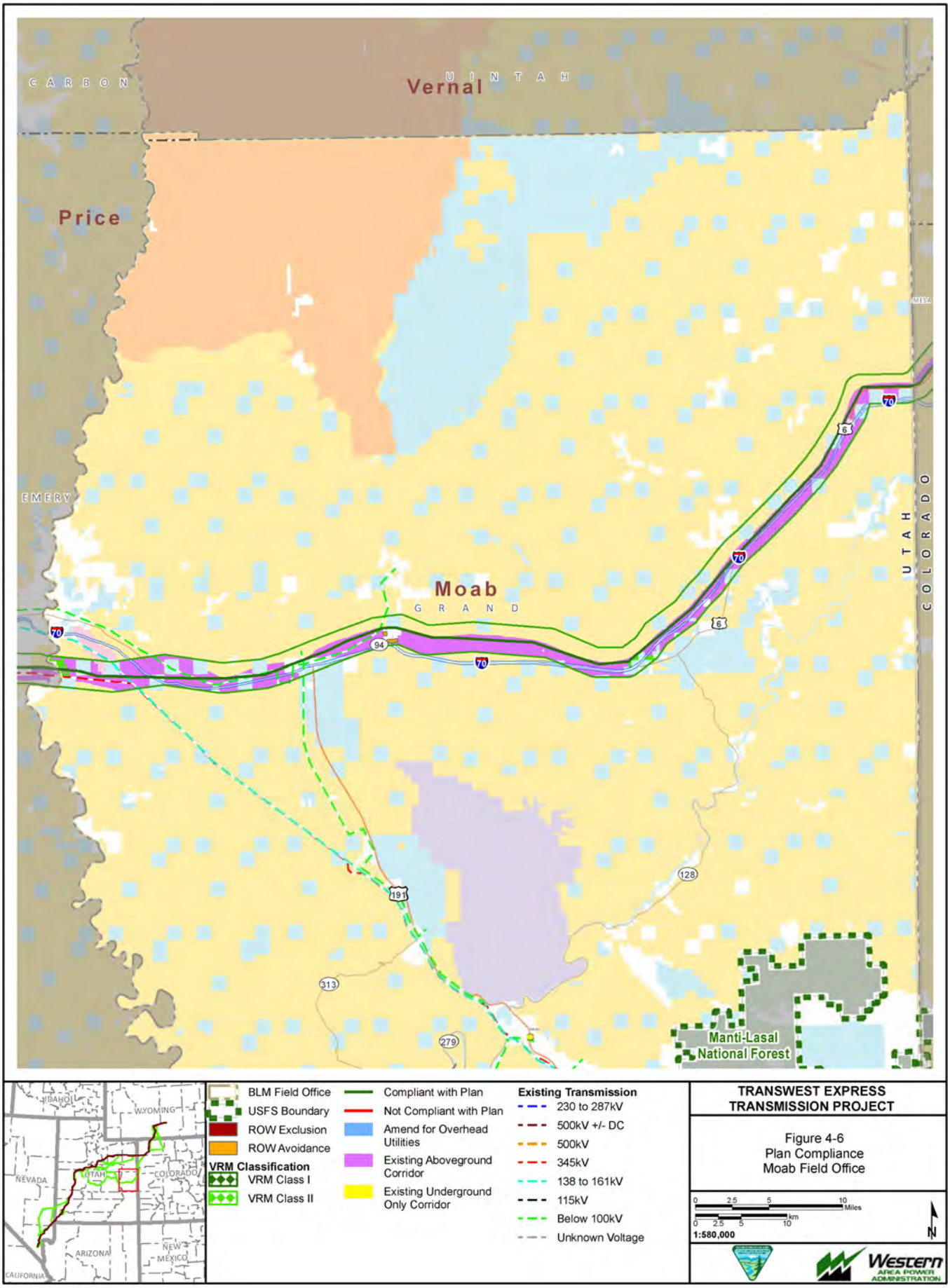

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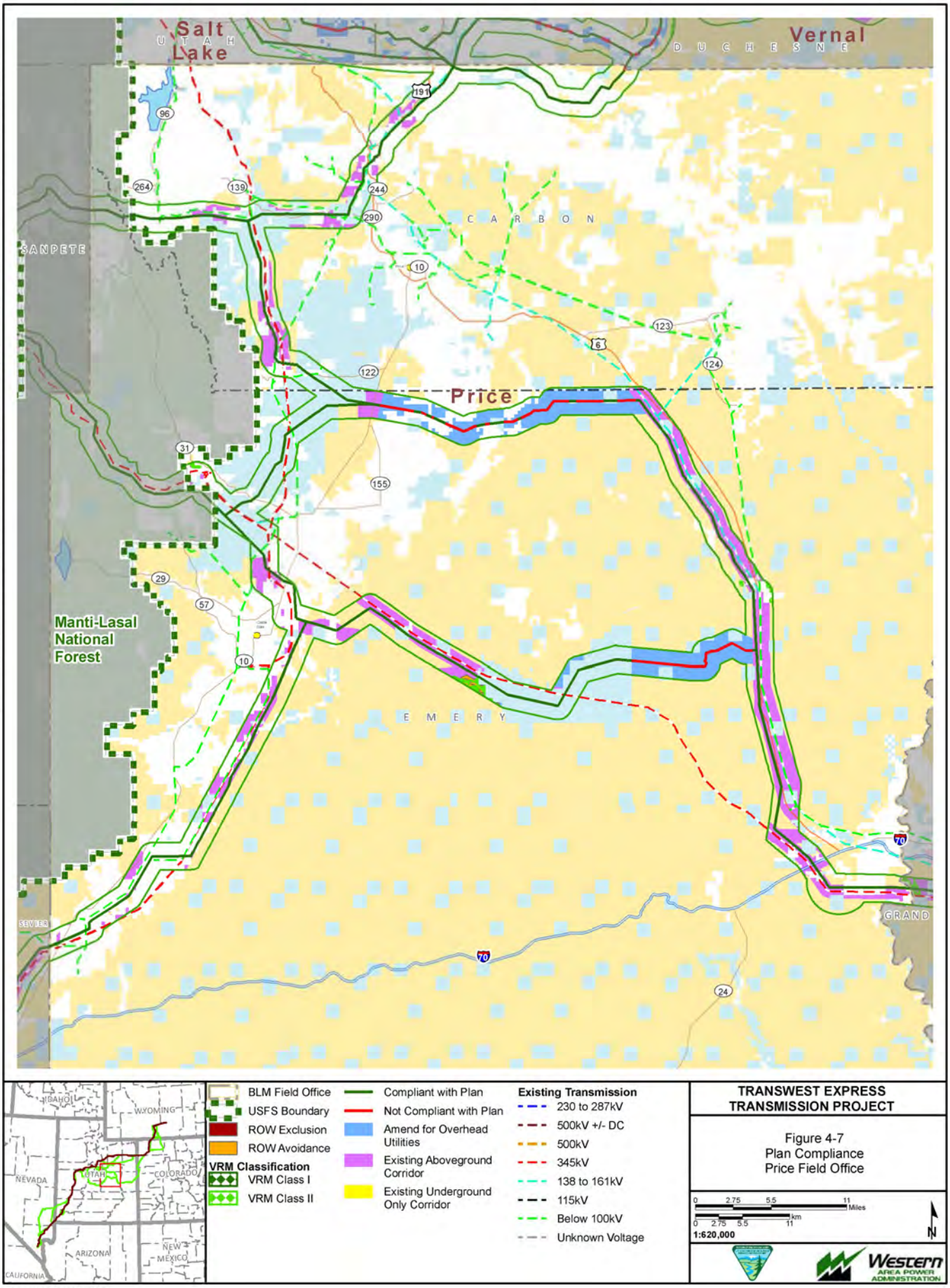

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 4-7
Plan Compliance
Price Field Office

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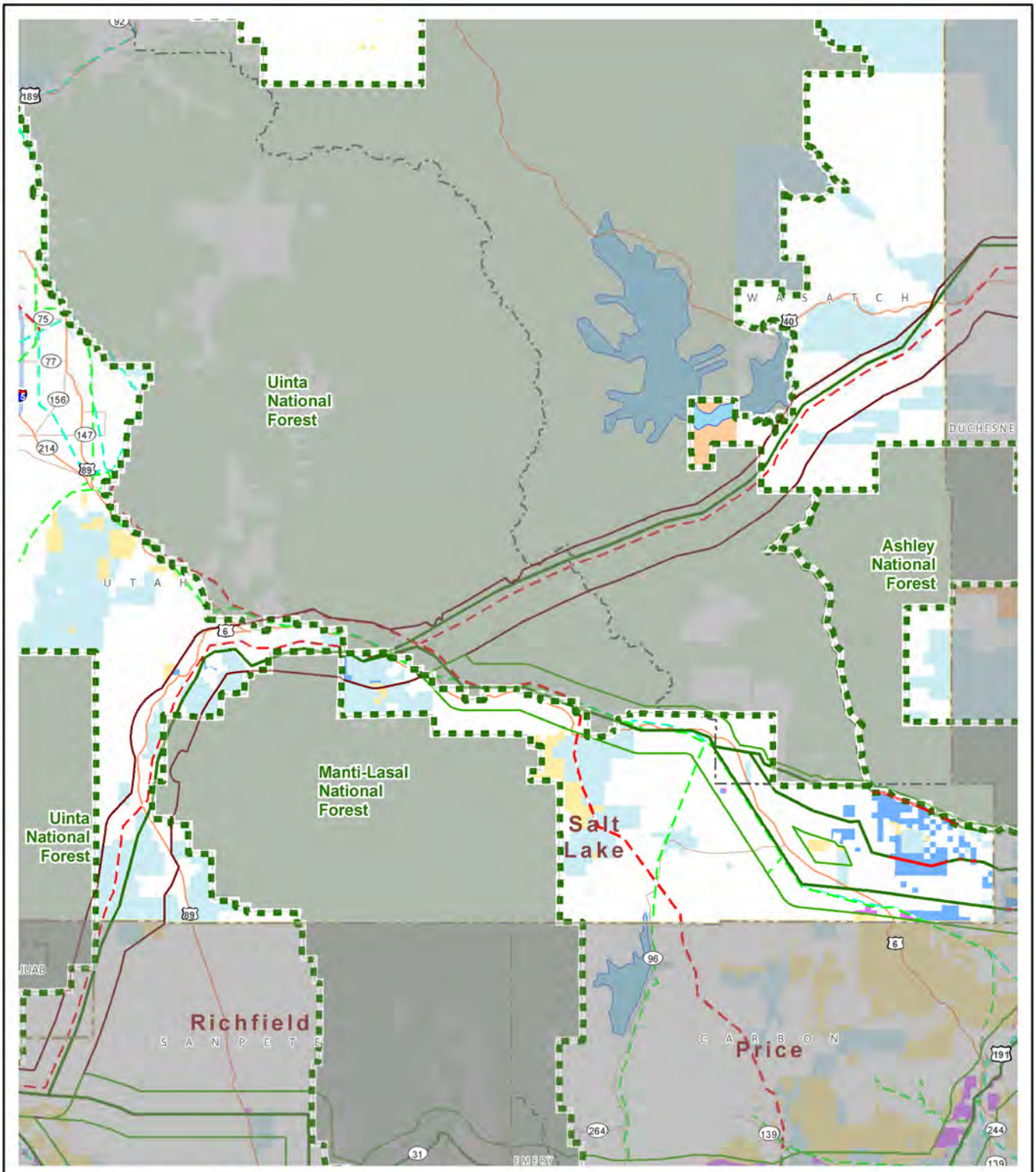

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Figure 4-8
Plan Compliance
Salt Lake Field Office

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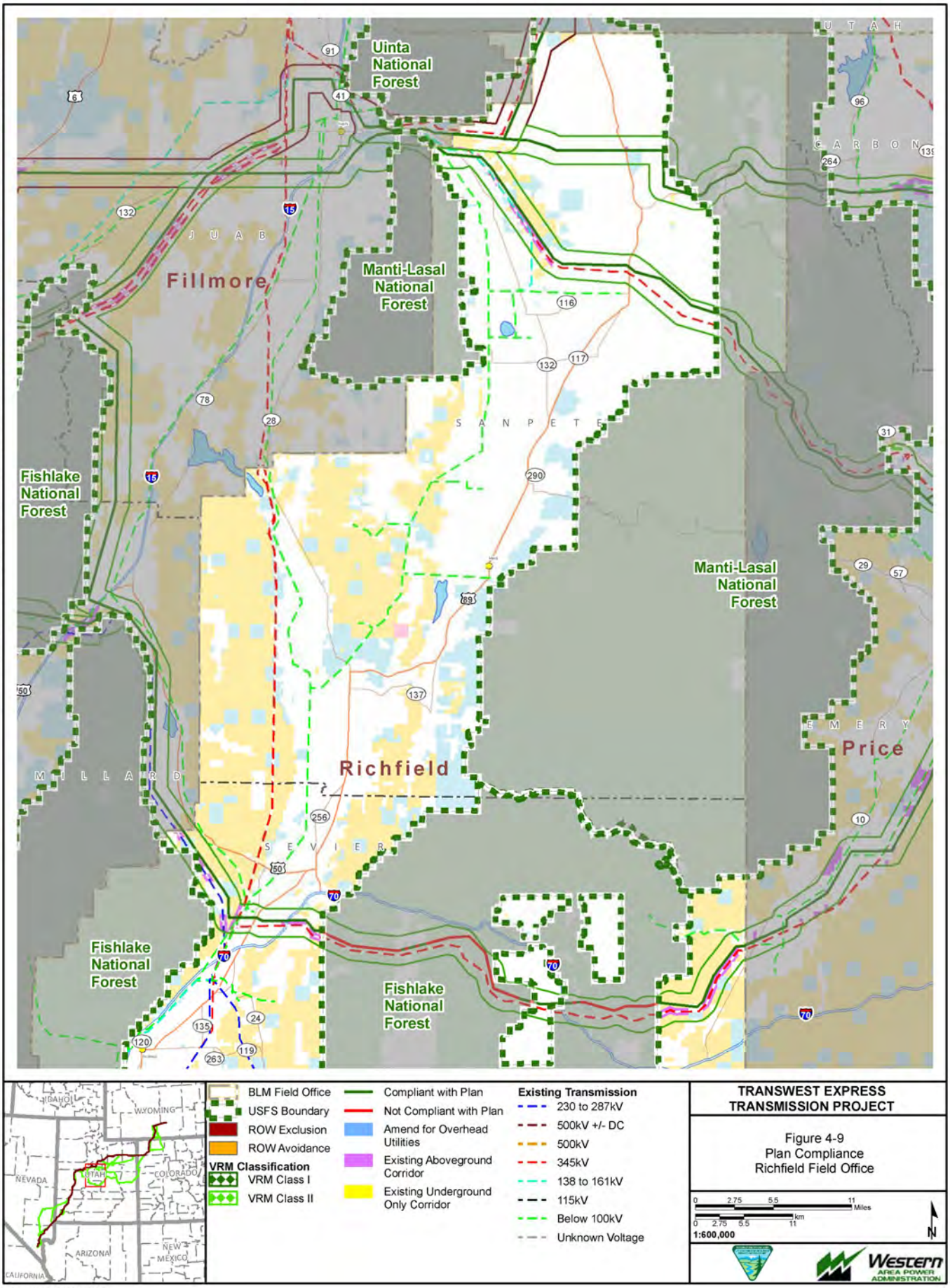
Uinta National Forest
Fillmore
Manti-Lasal National Forest
Fishlake National Forest
Manti-Lasal National Forest
Richfield
Price
Fishlake National Forest
Fishlake National Forest
U T A H
J U A B
S A N P E T E
M I L L A R D
S E V I E R
C A R B O N
E M E R Y
BLM Field Office
USFS Boundary
ROW Exclusion
ROW Avoidance
VRM Classification
VRM Class I
VRM Class II
Compliant with Plan
Not Compliant with Plan
Amend for Overhead Utilities
Existing Aboveground Corridor
Existing Underground Only Corridor
Existing Transmission
230 to 287kV
500kV +/- DC
500kV
345kV
138 to 161kV
115kV
Below 100kV
Unknown Voltage
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 4-9
Plan Compliance
Richfield Field Office
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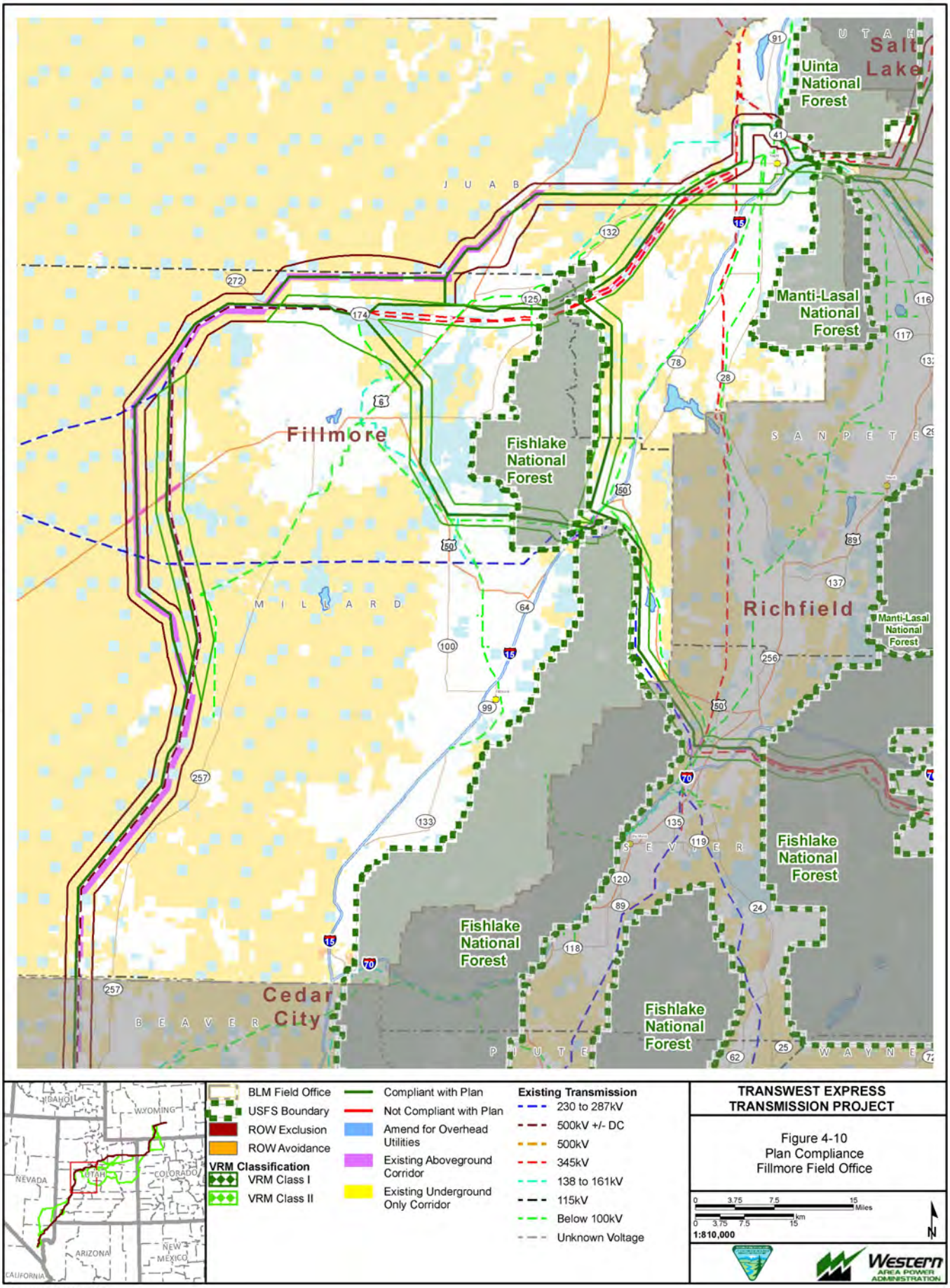

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Figure 4-10
Plan Compliance
Fillmore Field Office

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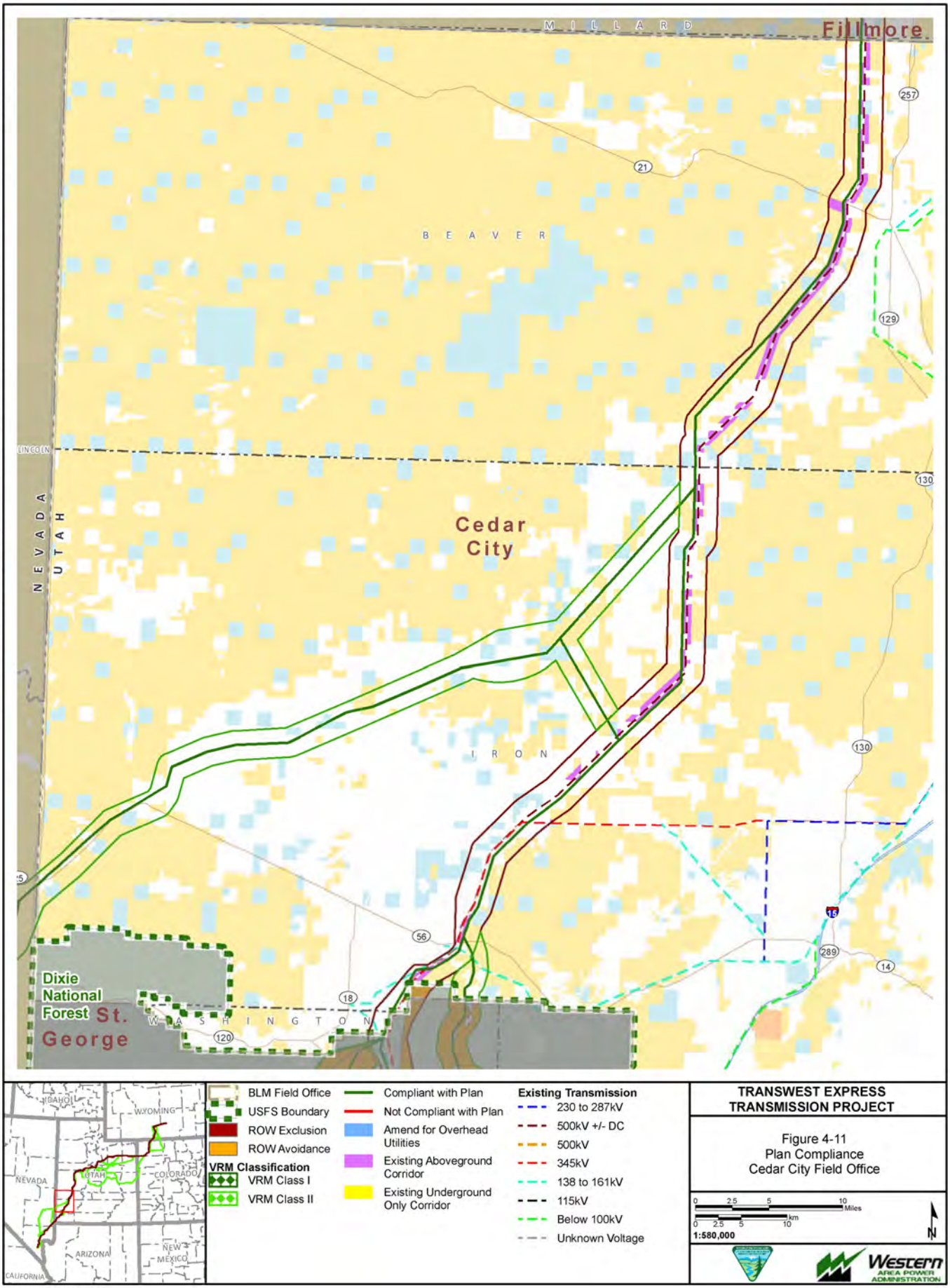

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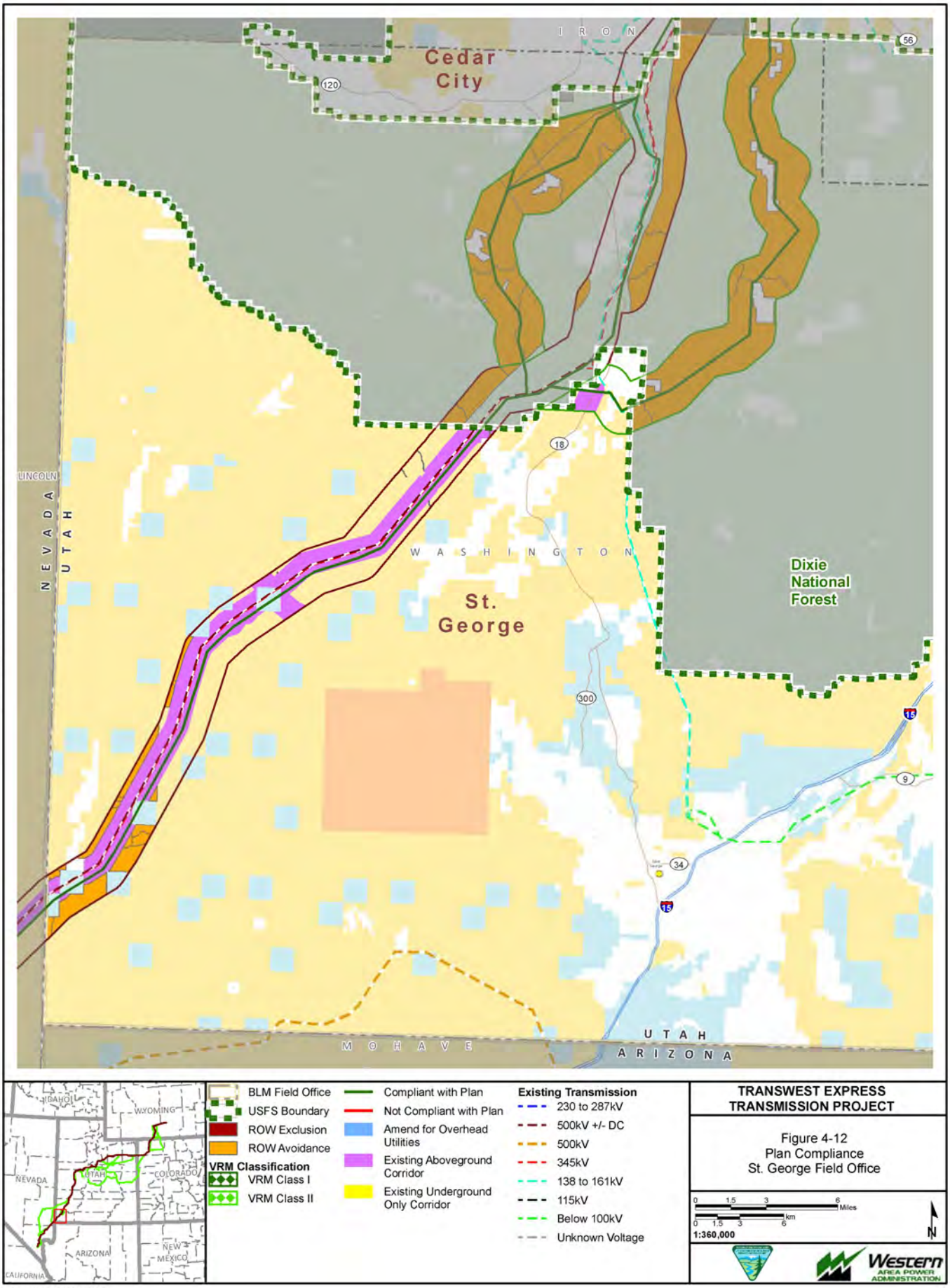

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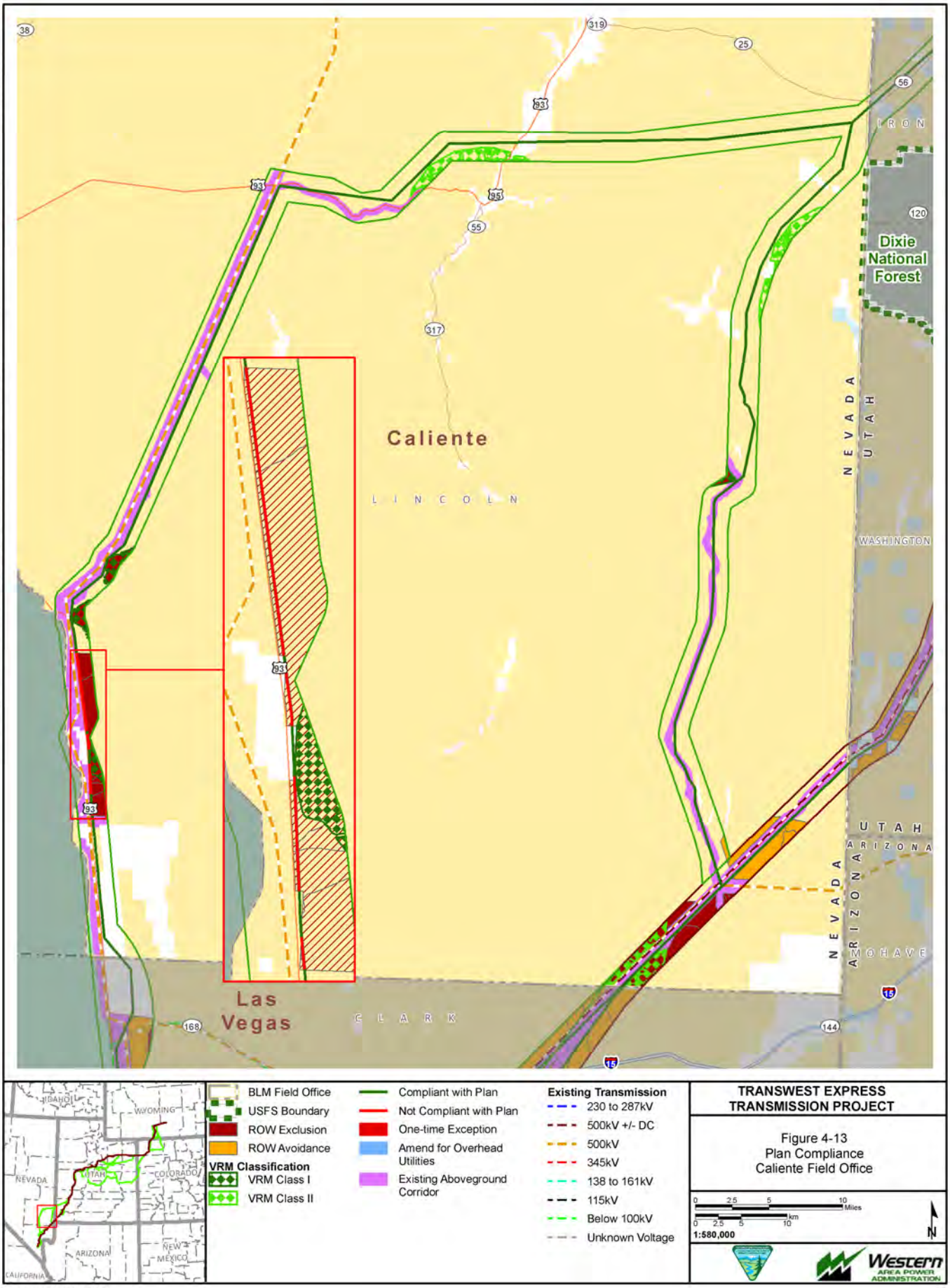

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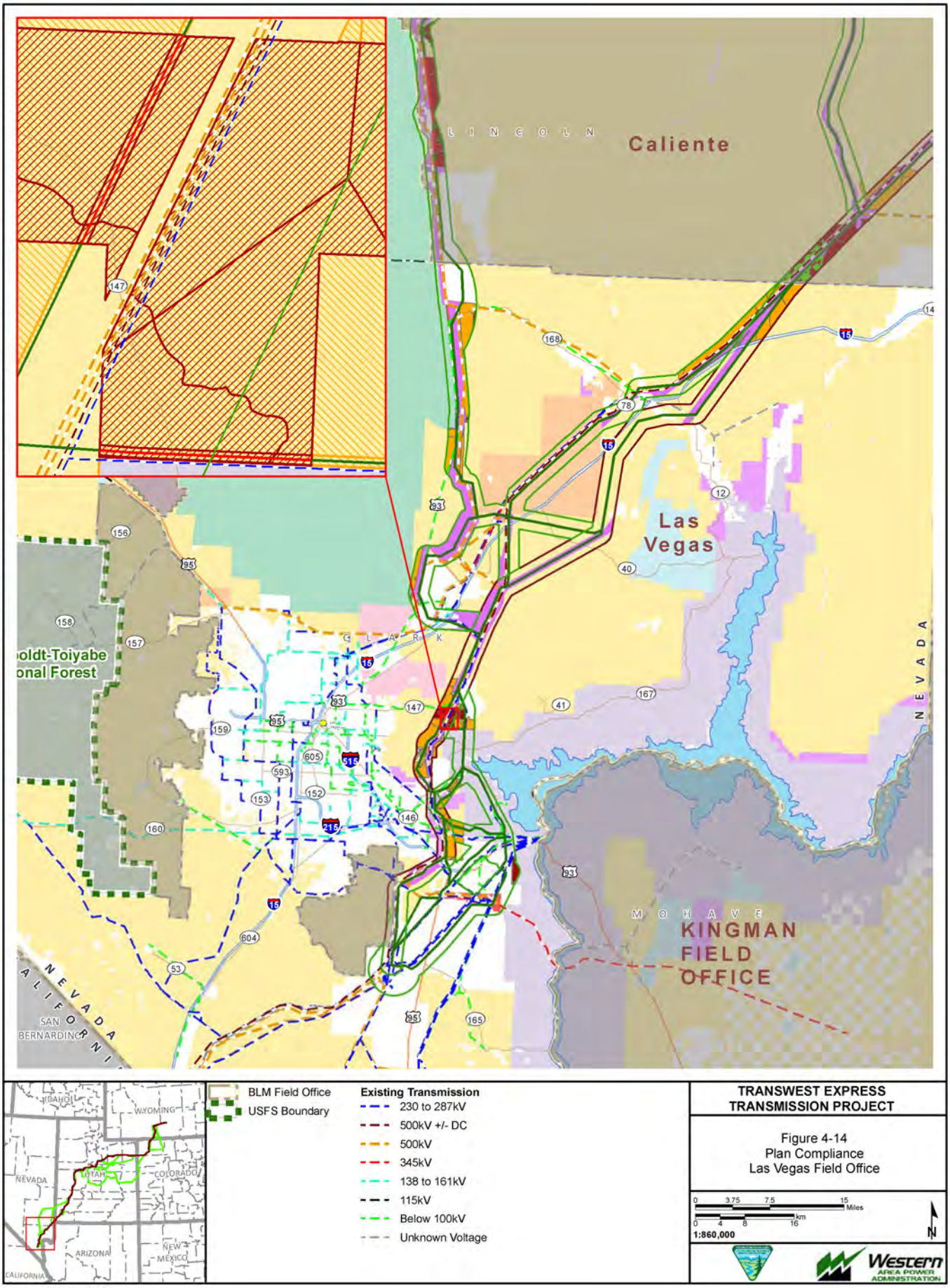

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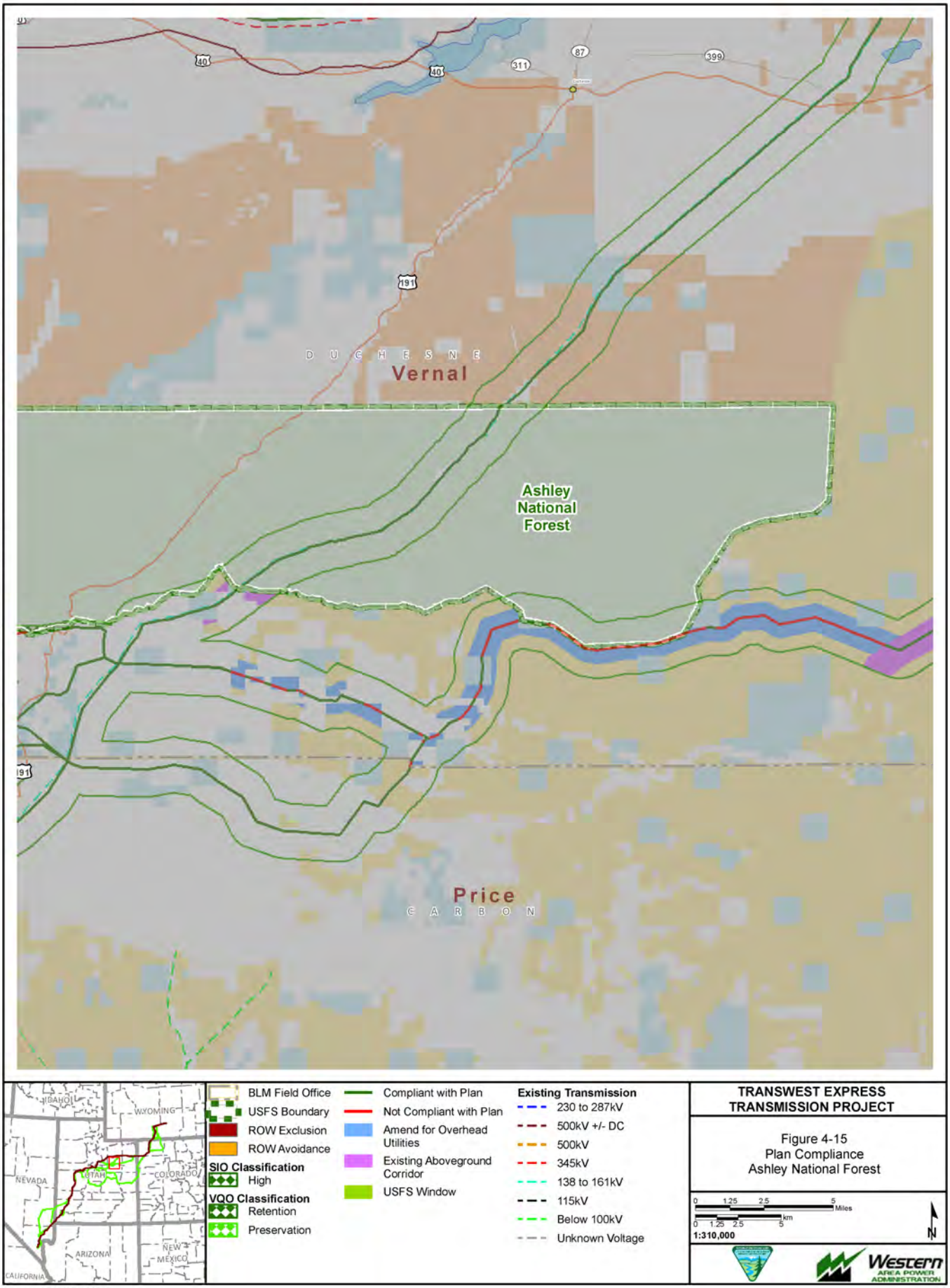

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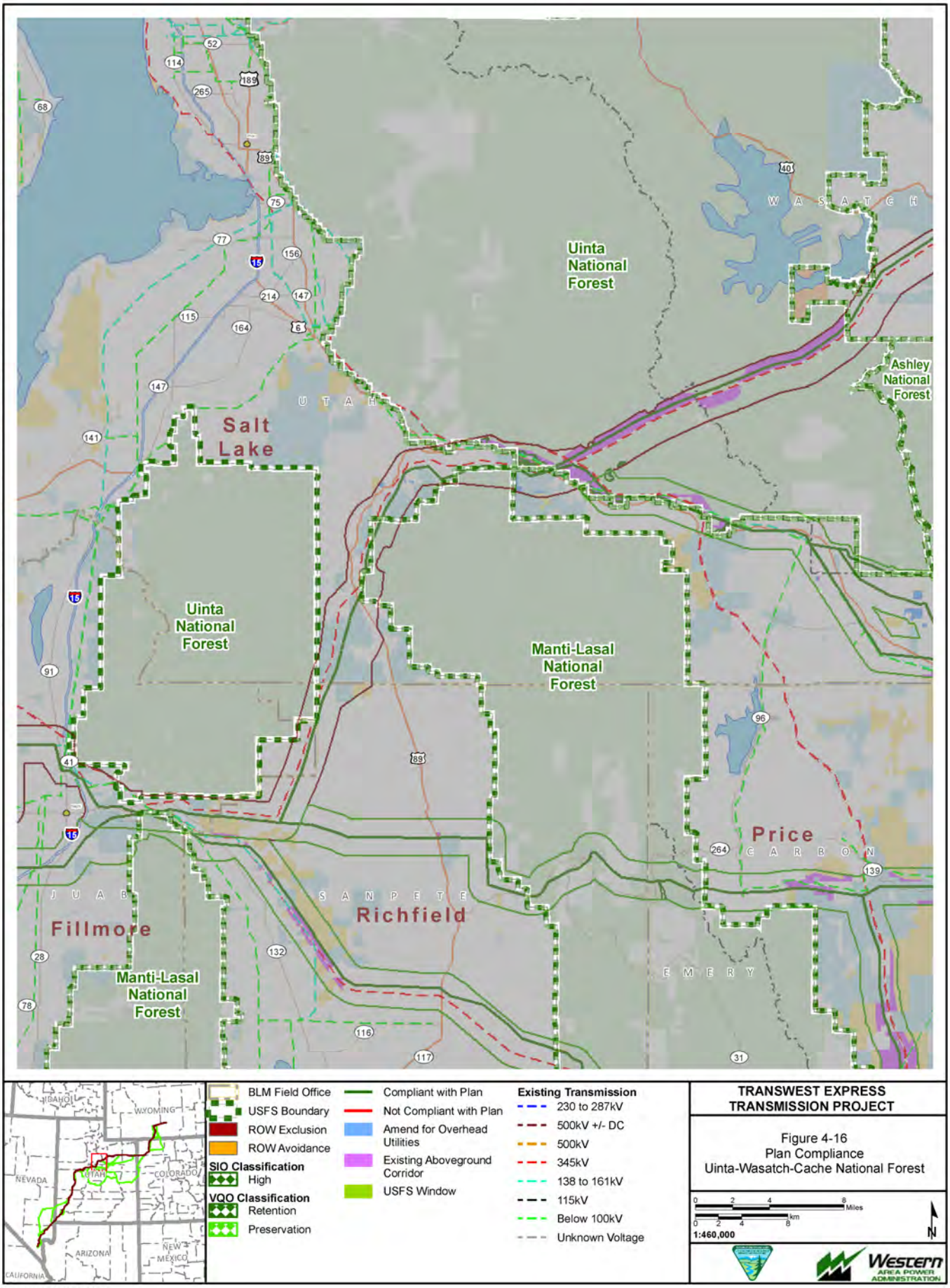
Uinta National Forest
Ashley National Forest
Salt Lake
Uinta National Forest
Manti-Lasal National Forest
Price
Richfield
Fillmore
Manti-Lasal National Forest
W A S A T C H
U T A H
J U A B
S A N P E T E
E M E R Y
C A R B O N
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
BLM Field Office
USFS Boundary
ROW Exclusion
ROW Avoidance
SIO Classification
High
VQO Classification
Retention
Preservation
Compliant with Plan
Not Compliant with Plan
Amend for Overhead Utilities
Existing Aboveground Corridor
USFS Window
Existing Transmission
230 to 287kV
500kV +/- DC
500kV
345kV
138 to 161kV
115kV
Below 100kV
Unknown Voltage
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 4-16
Plan Compliance
Uinta-Wasatch-Cache National Forest
Miles
km
1:460,000
N
Western AREA POWER ADMINISTRATION
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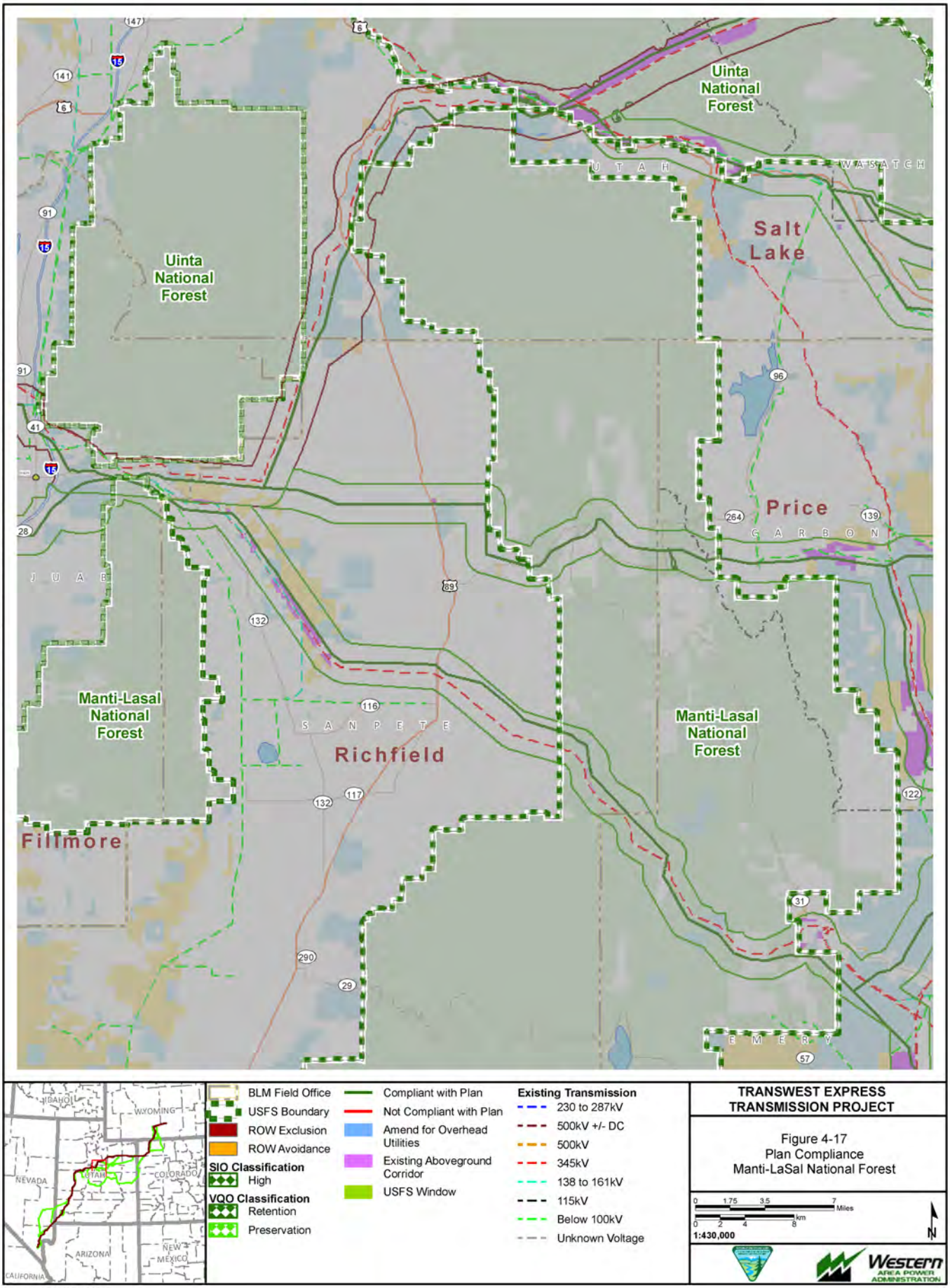

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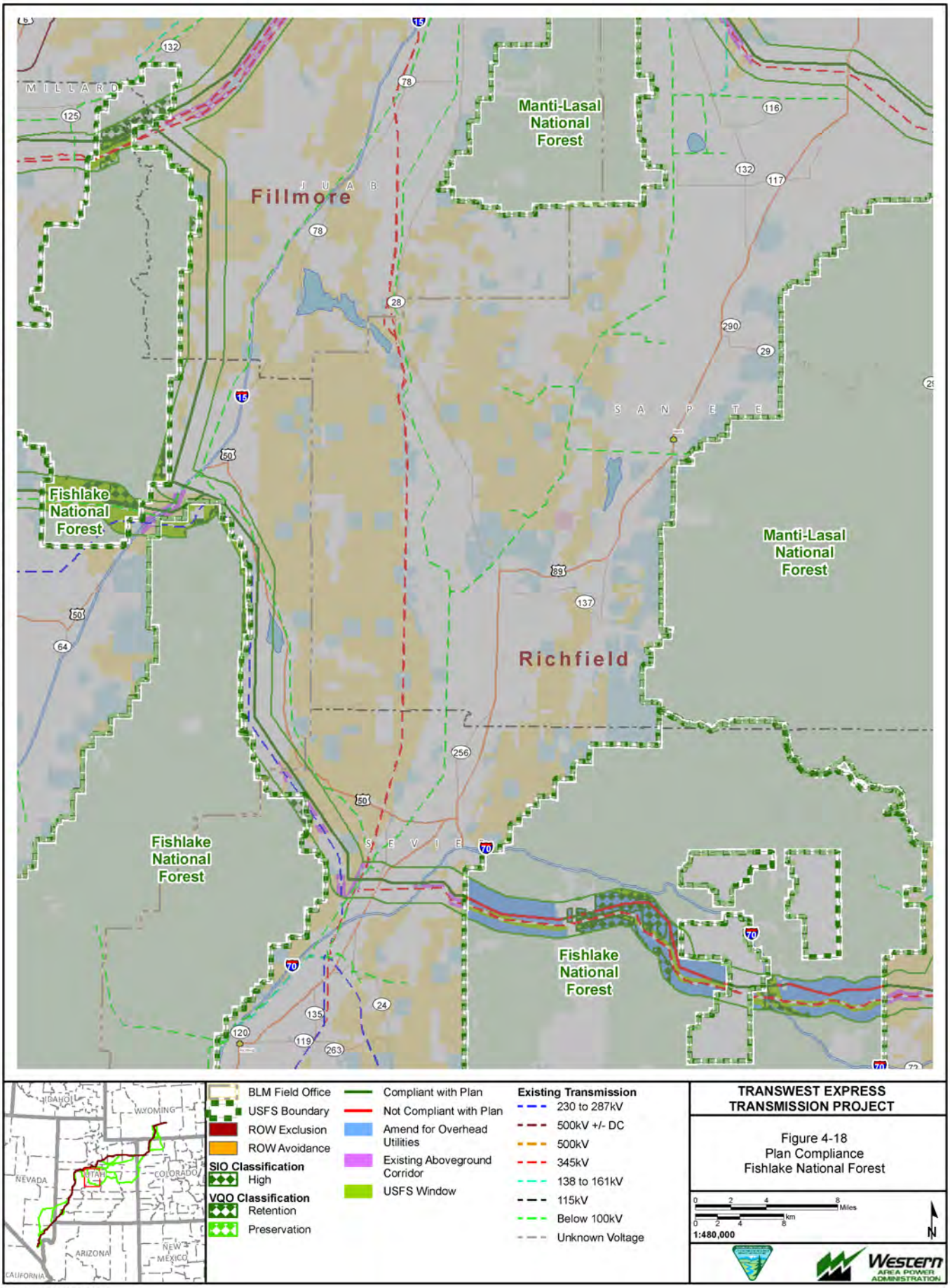
Manti-Lasal National Forest
Fillmore
Fishlake National Forest
Richfield
Manti-Lasal National Forest
Fishlake National Forest
Fishlake National Forest
MILLARD
JUAB
SANPETE
SEVIER
BLM Field Office
USFS Boundary
ROW Exclusion
ROW Avoidance
SIO Classification
High
VQO Classification
Retention
Preservation
Compliant with Plan
Not Compliant with Plan
Amend for Overhead Utilities
Existing Aboveground Corridor
USFS Window
Existing Transmission
230 to 287kV
500kV +/- DC
500kV
345kV
138 to 161kV
115kV
Below 100kV
Unknown Voltage
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 4-18
Plan Compliance
Fishlake National Forest
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Miles
km
N
Western AREA POWER ADMINISTRATION
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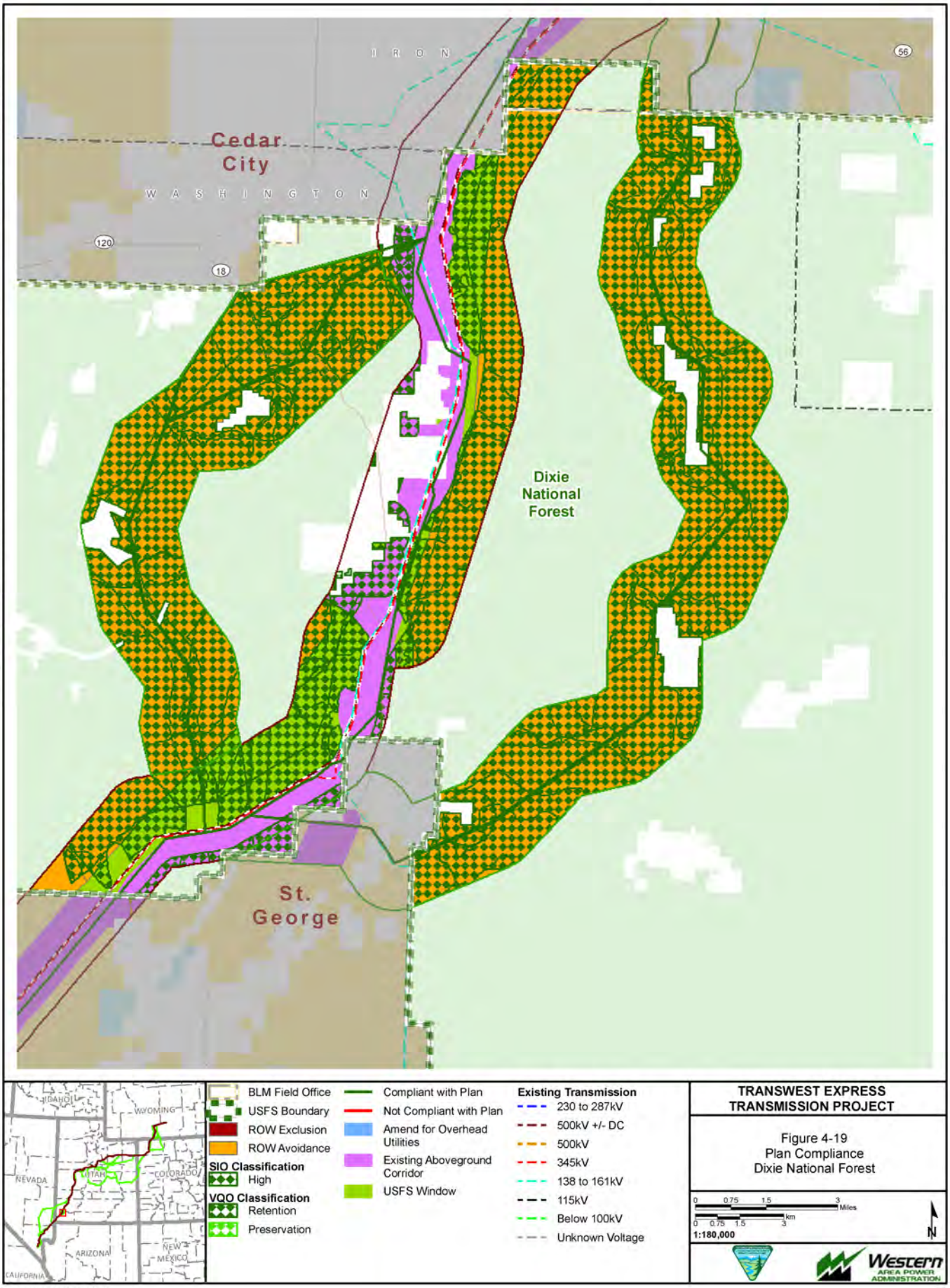

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4.4.1 BLM Rawlins Field Office

Alternatives A, B, C, and D as well as the Mexican Flats, Baggs, Fivemile Point North and Fivemile Point South Alternative Connectors traverse lands administered by the Rawlins FO. According to the RMP (RMP ROD, p. 2-17), "all BLM-administered public lands, except WSAs and some SD/MAs (including ACECs), are open to consideration for placement of transportation and utility ROW systems. Each transportation system and utility ROW will be located adjacent to existing facilities, when possible." Appendix A-34 of the RMP details ROW corridor and selection criteria. All alternatives traverse areas that would conflict with resource protection measures, including buffers to protect raptors and historic trails, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12. In addition to these resource conflicts, Alternative C and the Mexican Flats and Fivemile Point North Alternative Connectors would also conflict with buffers to protect surface water.

Alternative B is entirely situated within the underground-only 1,320-ft CIG/Entrega/WIC Transmission line corridor. To minimize environmental impacts and the proliferation of separate ROWs for TWE and/or other RFFA transmission projects within the FO, the BLM has indicated that a plan amendment would be needed to designate a new corridor or expand the existing corridor for any TWE project route traversing the FO.

For Alternative A, ROW decisions listed under Section 2.3.5 Lands and Realty in the RMP (p. 2-18) and Table A34-1 in Appendix 34 (p. A34-1) and Table A (page A-15) in the ROD for the Westwide Energy Corridor (WWEC) would be amended as follows for 58 miles ***(new text in bold italics)***:

<u>Utility/Transportation Systems</u>

1. Areas with important resource values will be avoided where possible in planning for new facility placement (600,290 acres). If it becomes necessary for facilities (i.e., linear ROWs) to be placed within avoidance areas, effects will be intensively managed. Avoidance and exclusion areas are identified on Map 2-33b and Table 2-5.

2. ***Utility corridors are designated as follows:***

   a. ***Rawlins-Wamsutter: The existing WWEC multi-modal utility corridor south of I-80 is expanded to two miles between Rawlins and Wamsutter. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. Minimum separation distance is required in greater sage-grouse core areas. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.***

   b. ***Wamsutter-Powder Rim: A north-south, two-mile-wide utility corridor is designated along the Sweetwater/Carbon County line for all utilities. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.***

Table A34-1. Designated ROW Corridors

Corridor	Width	Uses
Spence-Bairoil-Jim Bridger 230 kV Transmission Line	1,320'	Overhead utilities only
CIG/Entrega/WIC Transmission lines	1,320'	Buried utilities only
Lost Creek Pipeline	1,320'	Buried utilities only
WAPA 115 kV Transmission Line	1,320'	Overhead utilities only

Corridor	Width	Uses
I-80 Corridor	1,320' on either side of the interstate	Buried utilities only
Rawlins-Wamsutter WWEC Corridor[1]	~~***3,500'***~~ ***2 miles***	Multi-modal
Highway 789	1,320' east of the highway	Overhead utilities
Wamsutter-Powder Rim Corridor	***2 miles***	***All utilities***
Rock Springs to Dave Johnston 230 kV Transmission Line	1,320' north from the existing line	Overhead utilities only

[1] Not included in the Table A34-1 of the RMP but designated through the WWEC land use plan amendment process.

For Alternative B, ROW decisions listed under Section 2.3.5 Lands and Realty in the RMP (p. 2-18) and Table A34-1 in Appendix 34 (p. A34-1) and Table A (page A-15) in the ROD for WWEC would be amended as follows for 61 miles ***(new text in bold italics)***:

Utility/Transportation Systems

1. Areas with important resource values will be avoided where possible in planning for new facility placement (600,290 acres). If it becomes necessary for facilities (i.e., linear ROWs) to be placed within avoidance areas, effects will be intensively managed. Avoidance and exclusion areas are identified on Map 2-33b and Table 2-5.

2. Utility corridors are designated as follows:

a. Rawlins-Frewen: The existing WWEC multi-modal utility corridor south of I-80 is expanded to two miles between Rawlins and Frewen. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. Minimum separation distance is required in greater sage-grouse core areas. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.

b. CIG/Entrega/WIC Transmission lines: Conversion and expansion of the existing north-south, underground-only corridor to a two-mile wide underground and aboveground utility corridor is designated west of the Sweetwater/Carbon County line. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.

Table A34-1. Designated ROW Corridors

Corridor	Width	Uses
Spence-Bairoil-Jim Bridger 230 kV Transmission Line	1,320'	Overhead utilities only
CIG/Entrega/WIC Transmission lines	~~***1,320'***~~ ***2 miles***	Buried ***and overhead*** utilities ~~***only***~~
Lost Creek Pipeline	1,320'	Buried utilities only
WAPA 115 kV Transmission Line	1,320'	Overhead utilities only
I-80 Corridor	1,320' on either side of the interstate	Buried utilities only
Rawlins-Frewen WWEC Corridor[1]	~~***3,500'***~~ ***2 miles***	Multi-modal
Highway 789	1,320' east of the highway	Overhead utilities
Rock Springs to Dave Johnston 230 kV Transmission Line	1,320' north from the existing line	Overhead utilities only

[1] Not included in the Table A34-1 of the RMP but designated through the WWEC land use plan amendment process.

For Alternative C, ROW decisions listed under Section 2.3.5 Lands and Realty in the RMP (p. 2-18) and Table A34-1 in Appendix 34 (p. A34-1) and Table A (page A-15) in the ROD for WWEC would be amended as follows for 27 miles ***(new text in bold italics)***:

Utility/Transportation Systems

1. Areas with important resource values will be avoided where possible in planning for new facility placement (600,290 acres). If it becomes necessary for facilities (i.e., linear ROWs) to be placed within avoidance areas, effects will be intensively managed. Avoidance and exclusion areas are identified on Map 2-33b and Table 2-5.

2. Utility corridors are designated as follows:

a. Rawlins-Creston: The existing WWEC multi-modal utility corridor south of I-80 is expanded to two miles between Rawlins and Creston to allow. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. Minimum separation distance is required in greater sage-grouse core areas. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.

b. Highway 789: The existing utility corridor along Highway 789 from Creston to Baggs is expanded to two miles to allow for all utilities including high voltage overhead transmission. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. Minimum separation distance is required in greater sage-grouse core areas. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.

Table A34-1. Designated ROW Corridors

Corridor	Width	Uses
Spence-Bairoil-Jim Bridger 230 kV Transmission Line	1,320’	Overhead utilities only
CIG/Entrega/WIC Transmission lines	1,320’	Buried utilities only
Lost Creek Pipeline	1,320’	Buried utilities only
WAPA 115 kV Transmission Line	1,320’	Overhead utilities only
I-80 Corridor	1,320’ on either side of the interstate	Buried utilities only
Rawlins-Creston WWEC Corridor[1]	***~~3,500’~~ 2 miles***	Multi-modal
Highway 789	***~~1,320’ east of the highway~~ 2 miles***	Overhead utilities
Rock Springs to Dave Johnston 230 kV Transmission Line	1,320’ north from the existing line	Overhead utilities only

[1] Not included in the Table A34-1 of the RMP but designated through the WWEC land use plan amendment process.

For Alternative D (Agency Preferred Alternative) and the Baggs Alternative Connector, ROW decisions listed under Section 2.3.5 Lands and Realty in the RMP (p. 2-18) and Table A34-1 in Appendix 34 (p. A34-1) and Table A (page A-15) in the ROD for WWEC would be amended as follows for 76 miles ***(new text in bold italics)***:

Utility/Transportation Systems

1. Areas with important resource values will be avoided where possible in planning for new facility placement (600,290 acres). If it becomes necessary for facilities (i.e., linear ROWs) to

be placed within avoidance areas, effects will be intensively managed. Avoidance and exclusion areas are identified on Map 2-33b and Table 2-5.

2. ***Utility corridors are designated as follows:***

   a. ***Rawlins-Wamsutter: The existing WWEC multi-modal utility corridor south of I-80 is expanded to two miles between Rawlins and Wamsutter. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. Minimum separation distance is required in greater sage-grouse core areas. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.***

   b. ***Wamsutter-Baggs-Powder Rim: A two-mile wide utility corridor is designated north-south to Baggs then east-west to Powder Rim for all utilities. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) within the designated corridor.***

Table A34-1. Designated ROW Corridors

Corridor	Width	Uses
Spence-Bairoil-Jim Bridger 230 kV Transmission Line	1,320’	Overhead utilities only
CIG/Entrega/WIC Transmission lines	1,320’	Buried utilities only
Lost Creek Pipeline	1,320’	Buried utilities only
WAPA 115 kV Transmission Line	1,320’	Overhead utilities only
I-80 Corridor	1,320’ on either side of the interstate	Buried utilities only
Rawlins-Creston WWEC Corridor[1]	***~~3,500’~~ 2 miles***	Multi-modal
Highway 789	1,320’ east of the highway	Overhead utilities
Wamsutter-Baggs-Powder Rim Corridor	***2 miles***	***All utilities***
Rock Springs to Dave Johnston 230 kV Transmission Line	1,320’ north from the existing line	Overhead utilities only

[1] Not included in the Table A34-1 of the RMP but designated through the WWEC land use plan amendment process.

4.4.2 BLM Little Snake Field Office

Alternatives A, B, C, and D traverse lands administered by the Little Snake FO. Alternatives A, B, and D are located either partly or wholly outside of designated corridors. According to the RMP (RMP ROD, p. RMP-51), “Section 503 of FLPMA provides for the designation of ROW corridors and encourages use of in-common ROWs to minimize environmental impacts and the proliferation of separate ROWs. BLM policy, as described in BLM Manual 2801.13B1, is to encourage prospective applicants to locate their proposals within corridors…The remainder of the LSFO will be open for the consideration of ROWs on a case-by-case basis, with stipulations identified during activity level environmental reviews.”

All alternatives traverse areas that would conflict with resource protection measures, as follows:

- Alternatives A and C encroach on buffers to protect raptors, special status aquatic species, Greater sage-grouse, perennial water sources, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12. In addition, Alternative C encroaches on buffers to protect a State Wildlife Area.

- Alternatives B and D encroach on buffers to raptors, Greater sage-grouse, white-tailed prairie dog towns, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12.

Resource conflicts with Alternative C would occur within a designated utility corridor, where exceptions can be granted if mitigation or avoidance is not feasible. Resource conflicts for Alternatives A, B, and D occur in areas outside of designated corridors. To minimize environmental impacts and the proliferation of separate ROWs for TWE and other RFFA transmission projects within the FO, the BLM has indicated that a plan amendment would be needed to designate a new corridor for any TWE project route traversing the FO for routes outside of the electric-only or multi-modal designated WWEC corridors.

For Alternative A, ROW decisions listed under in Table 2-17 for Lands and Realty in the RMP (p. RMP-53) would be amended as follows for 34 miles ***(new text in bold italics)***:

> ***Utility Corridors***
>
> ***A north-south, two-mile wide aboveground utility corridor is designated along Sevenmile Ridge following County Road 75 from the Wyoming state line south to U.S. Highway 40 at Maybell. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.***

For Alternatives B and D (Agency Preferred Alternative), ROW decisions listed under in Table 2-17 for Lands and Realty in the RMP (p. RMP-53) would be amended as follows for 27 miles ***(new text in bold italics)***:

> ***Utility Corridors***
>
> ***A north-south, two-mile wide aboveground utility corridor is designated along the foothills of Sevenmile Ridge east of County Road 75 from the Wyoming state line south to U.S. Highway 40 at Maybell. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.***

4.4.3 BLM White River Field Office

Alternatives A, B, C, D, E, and F traverse lands administered by the White River FO. According to the RMP (RMP ROD, p. 2-49), “applications for land use authorizations (e.g., rights-of-way, leases, and permits) will be considered on a case-by-case basis and the remainder of the Resource Area outside of exclusion and avoidance areas will be considered open for land use authorizations.” All alternatives traverse areas that would conflict with resource protection measures, as follows:

- Alternatives A, D, E, and F (Agency Preferred) encroach on buffers to protect raptors.
- Alternatives B and C encroach on buffers to Greater sage-grouse, raptors, areas designated as VRM Class II and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12.

Alternatives A, D, E, and F (Agency Preferred) are situated within utility corridors designated through WWEC where exceptions may be granted if avoidance or mitigation would not be feasible. Therefore, a plan amendment would not be required.

Alternatives B and C are situated within an underground only ROW corridor, the 1-mile-wide Dragon Trail-Atchee Ridge ROW corridor. A portion of the route passes through VRM Class II in Garfield County, an area that inventoried as VRI Class III.

For Alternatives B and C, utility corridor decisions in the RMP (p. 2-51) would be amended as follows for 38 miles ***(new text in bold italics)***:

> DRAGON TRAIL-ATCHEE RIDGE: This corridor follows the route once proposed as the Rangely Loop segment of the Northwest Pipeline Expansion Project. It runs south from Rangely, to the vicinity of Baxter Pass, is approximately ~~***1 mile***~~ ***two miles*** wide, and will accommodate all buried ***and overhead*** linear facilities. ***Power lines located within the designated utility corridor would be excepted from the requirements associated with VRM Class II areas. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.***

4.4.4 BLM Grand Junction Field Office

Proposed routes through this area are considered to be in conformance with the RMP. Alternatives B and C pass through a 4-mile wide utility corridor (from De Beque to Southern Boundary of resource area) for all major power lines, but some portions deviate. While the RMP encourages the use of existing corridors (RMP ROD, p. 2-29), the remaining public lands are suitable for consideration for public utilities.

Alternatives B and C traverse areas that would conflict with resource protection measures. Alternatives B and C cross portions of the Prairie Canyon ACEC, elk production areas, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12. However, these alternatives would be mostly situated within utility corridors designated through the RMP and exceptions could be granted if avoidance or minimization isn't feasible. Therefore, a plan amendment would not be required.

4.4.5 BLM Vernal Field Office

Alternatives A, B, C, D, E, and F (Agency Preferred Alternative) traverse lands administered by the Vernal FO. All alternatives traverse areas that would conflict with resource protection measures, as follows:

- Alternatives A and E encroach on buffers to protect white-tailed prairie dog colonies, Greater sage-grouse, floodplain and riparian areas, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12.
- Alternatives B and C encroach on buffers to protect Mexican Spotted Owl and floodplain and riparian areas.
- Alternatives D and F (Agency Preferred) encroaches on buffers to protect white-tailed prairie dog colonies, Greater sage-grouse, Mexican Spotted Owl, floodplain and riparian, the Lower Green River ACEC, White River corridors, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12, Visual Resources.

Alternative A, B, C, D, E, and F (Agency Preferred) would be partially situated outside of designated utility corridors. According to decision LAR-42 (RMP ROD, p. 91), major linear ROWs exceeding the size thresholds that are proposed outside of the preferred, designated corridors may require a plan amendment.

For Alternative A, utility corridor decision LAR-42 in the RMP (p. 91) would be amended as follows for 19 miles ***(new text in bold italics)***:

> <u>LAR-42</u>
>
> Major linear ROWs meeting the above thresholds that are proposed outside of the preferred, designated corridors may require a plan amendment.

The RMP has been amended to accommodate a new aboveground utility corridor up to one mile wide for high voltage transmission lines requiring straight east-west alignments between the Colorado State line near Dinosaur, CO and Randlett, UT. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.

For Alternatives B and C, utility corridor decision LAR-42 in the RMP (p. 91) would be amended as follows for 6 miles ***(new text in bold italics)***:

LAR-42

Major linear ROWs meeting the above thresholds that are proposed outside of the preferred, designated corridors may require a plan amendment.

The RMP has been amended to accommodate a new aboveground utility corridor up to one mile wide for high voltage transmission lines requiring straight north-south alignments traversing Atchee Ridge Road across the Utah/Colorado State line. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.

For Alternative D, utility corridor decision LAR-42 in the RMP (p. 91) would be amended as follows for 17 miles ***(new text in bold italics)***:

LAR-42

Major linear ROWs meeting the above thresholds that are proposed outside of the preferred, designated corridors may require a plan amendment.

The RMP has been amended to accommodate a new aboveground utility corridor up to one mile wide for high voltage transmission lines requiring east-west alignments south of the Ashley National Forest boundary, east of Highway 191. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.

For Alternative E, utility corridor decision LAR-42 in the RMP (p. 91) would be amended as follows for 6 miles ***(new text in bold italics)***:

LAR-42

Major linear ROWs meeting the above thresholds that are proposed outside of the preferred, designated corridors may require a plan amendment.

The RMP has been amended to accommodate a new aboveground utility corridor up to one mile wide for high voltage transmission lines requiring east-west alignments between Highway 88 and Randlett, UT, west of the existing utility corridor. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.

For Alternative F (Agency Preferred Alternative), utility corridor decision LAR-42 in the RMP (p. 91) would be amended as follows for 22 miles ***(new text in bold italics)***:

LAR-42

Major linear ROWs meeting the above thresholds that are proposed outside of the preferred, designated corridors may require a plan amendment.

The RMP has been amended to accommodate a new aboveground utility corridor up to one mile wide for high voltage transmission lines requiring east-west alignments south of the Ashley National Forest boundary, east of Highway 191. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.

4.4.6 BLM Moab Field Office

Alternatives B and C traverse lands administered by the Moab FO. Proposed routes through this area are considered to be in conformance with the RMP. The RMP does not specifically restrict ROW to designated corridors. Alternatives B and C mostly follow the I-70 utility corridor and includes all major existing ROW as identified in the RMP with a 0.5-mile width on each side of the widest ROW corridor (LAR-14).

Alternatives B and C traverse areas that would conflict with resource protection measures. Alternatives B and C cross segments of the Old Spanish Trail (within existing designated utility corridors), the Three Rivers and Westwater mineral withdrawal area, select rivers for protection of special status aquatic species, and riparian area buffers, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12, Visual Resources. However, alternatives would be mostly situated within utility corridors designated through the RMP and exceptions could be granted if avoidance or minimization isn't feasible. Therefore, a plan amendment would not be required.

4.4.7 BLM Price Field Office

Alternatives B, C, and D as well as the Price and Castle Dale alternative connectors and a portion of the Emma Park Alternative Variation traverse lands administered by the Price FO. Alternative D as well as the Price and Castle Dale alternative connectors and a portion of the Emma Park Alternative Variation would not meet resource objectives that establish buffers to protect streams. However, these alternatives are situated within utility corridors designated through the RMP and the transmission line can be designed to avoid the water resource buffers and access roads routed to minimize conflict. Therefore, a plan amendment would not be required for these alternatives.

Alternative D and the Price and Castle Dale alternative connectors and a portion of the Emma Park Alternative Variation are situated within utility corridors designated through the RMP where they cross BLM-administered land. However, Alternatives B and C would be partially situated on lands outside of designated corridors and would require a plan amendment to designate a new utility corridor in these areas. The RMP identifies utility corridors as the preferred location for future major linear ROWs including transmission (not distribution) lines with a voltage capacity of 69 kV or greater (LAR-23, RMP ROD, p. 122). LAR-24 indicates that any new utility corridors will require a plan amendment (RMP ROD, p. 123).

Alternatives B and C traverse areas that would conflict with resource protection measures. Alternative B crosses segments of the Old Spanish Trail (within existing designated utility corridors), buffers to protect white-tailed prairie dog colonies, and stream protection buffers. Alternative C crosses portions of two ACECs (San Rafael Canyon as well as the Dry Wash and Molen Seep units of the Rock Art ACECs), segments of the Old Spanish Trail (within existing designated utility corridors), buffers to protect white-tailed prairie dog colonies, stream protection buffers, and areas that would conflict with visual quality objectives as determined through the TWE impact analysis in Section 3.12. Therefore, plan amendments

that allow exceptions for these stipulations in the newly designated utility corridors would also be required.

For Alternative B, utility corridor decision LAR-22 in the RMP (p. 122) would be amended as follows for 14 miles ***(new text in bold italics)***:

> LAR-22
>
> Designate existing utility corridors, (including the WUG updates to the Western Regional Corridor Study and west-wide energy corridors designated pursuant to the Energy Policy Act of 2005 and studied in an interagency Programmatic EIS) and additional corridors subject to physical barriers and sensitive resource values (Map R-21).
>
> ***A new east-west aboveground utility corridor up to one mile is designated south of the Carbon County line between U.S. Highway 191/6 and State Route 10 to accommodate high voltage transmission. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible.***

For Alternative C, utility corridor decision LAR-22 in the RMP (p. 122) would be amended as follows for 10 miles ***(new text in bold italics)***:

> LAR-22
>
> Designate existing utility corridors, (including the WUG updates to the Western Regional Corridor Study and west-wide energy corridors designated pursuant to the Energy Policy Act of 2005 and studied in an interagency Programmatic EIS) and additional corridors subject to physical barriers and sensitive resource values (Map R-21).
>
> ***A new east-west aboveground utility corridor up to one mile is designated along County Road 401/Green River Cutoff between U.S. Highway 191/6 and Castle Dale to accommodate high voltage transmission. Exceptions to resource stipulations within the designated corridor may be granted if measures of avoidance or minimization are not feasible. If future utilities cannot avoid ROW Exclusion Areas designated through the RMP encroaching into the corridor, then relocation of the utility or a plan amendment would be needed.***

4.4.8 BLM Salt Lake Field Office

Alternatives A, E, F, and the Emma Park Alternative Variation traverse the Salt Lake FO. However, only Alternative F (Agency Preferred Alternative) and the Emma Park Alternative Variation traverse small parcels of lands administered by the Salt Lake FO. These alternatives are not located within a designated utility corridor when crossing public lands. According to the RMP (RMP ROD, p. 56), “future proposals for major rights-of-way such as pipelines, large power lines and permanent improved roads must use identified corridors. Otherwise, a planning amendment and appropriate environmental analysis will be required. Proposals that are not considered major may be sited outside corridors after demonstrating that locating within a corridor is not viable. In all cases, the utilization of ROW in common shall be considered whenever possible. ROW, whether within or outside a corridor, will avoid the following areas to the maximum extent possible:

- Lands within 0.5 mile of greater sage-grouse strutting grounds if the disturbance would adversely impact the effectiveness of the lek.
- Lands within 1200 feet of riparian/aquatic habitats.

- Lands within VRM class II and III areas.
- Lands within WSAs.
- Lands where an aboveground ROW would be an obvious visual or physical intrusion such as ridge tops or narrow drainages.
- Lands with slopes greater than 30 percent.
- Lands with known or suspected hazardous materials."

For Alternative F (Agency Preferred Alternative) and the Emma Park Alternative Variation, transportation and utility corridor decisions associated with the RMP (p. 56) would be amended as follows for 3 miles ***(new text in bold italics)***:

> ***Decision 2***
>
> ***A two-mile wide aboveground utility corridor is designated south of the Ashley National Forest boundary between Highway 191 and U.S. Highway 6 to accommodate future high-voltage transmission lines.***

4.4.9 BLM Richfield Field Office

Alternatives A, B, C, D, E, and F traverse lands administered by the Richfield FO. Proposed routes through this area are considered to be in conformance with the RMP. The RMP does not specifically restrict ROWs to designated corridors. According to the LAR-33 (RMP ROD, p. 130), "to minimize adverse environmental impacts and the proliferation of separate ROWs, use common ROWs whenever possible, including collocation of new utility transmission lines and other facilities within existing utility and highway corridors."

Alternatives B, C, and D would not meet resource objectives that establish buffers to protect streams and Alternative C would traverse a wetland. However, these alternatives are situated within utility corridors designated through the RMP and the transmission line can be designed to avoid the water resource buffers and access roads routed to minimize conflict. Therefore, a plan amendment would not be required.

4.4.10 BLM Fillmore Field Office

Alternatives A, B (Agency Preferred in Region III), C, D, E, and F (Agency Preferred in Region II) as well as the Lynndyl and IPP East Alternative Connectors traverse lands administered by the Fillmore FO. Proposed routes through this area are considered to be in conformance with the RMP. The RMP does not specifically restrict ROWs to designated corridors. According to the Warm Springs RMP (Warm Springs ROD, p.40), "new ROW will be restricted to designated corridors wherever feasible. Special management designation areas and VRM Class II areas are ROW avoidance areas." According to the House Range RMP, (House Range ROD, p. 67), "Section 503 of FLPMA states '…utilization of ROW in common shall be required to the extent practical…' The utilization of existing corridors, whether designated or not, will be standard procedure."

The point where Alternatives A, D, E, and F converge with U.S. Highway 6 south of Jericho would not be able to meet visual quality objectives as determined through the TWE impact analysis in Section 3.12. However, this area is within a utility corridor designated through WWEC, and exceptions to visual resource conflicts could be granted if mitigation and avoidance is not feasible. Therefore, a plan amendment would not be required.

4.4.11 BLM Cedar City Field Office

Alternatives A, B (Agency Preferred), and C as well as the Avon Alternative Connector and northern portions of the Pinto Alternative Variation traverse lands administered by the Cedar City FO. Proposed routes through this area are considered to be in conformance with the RMP. The RMP does not specifically restrict ROWs to designated corridors. According to the RMP (RMP ROD, p. 6), “encourage, to the maximum extent practicable, the location of new major ROW within designated corridors.”

The point where Alternatives B and C diverge at the state line would not be able to meet visual quality objectives as determined through the TWE impact analysis in Section 3.12. However, the BLM has determined that a plan amendment would not be required, but visual resource mitigation and avoidance would be used to the extent practical to minimize the conflict.

4.4.12 BLM St. George Field Office

Alternative A and the southern portion of the Pinto Alternative Variation traverse lands administered by the St. George FO. These alternatives are situated within utility corridors designated by WWEC or the RMP. According to the RMP decision LD-12 (RMP ROD, p. 2.3), applications for new ROW on public lands will be considered and analyzed on a case-by-case basis. Proposals will be reviewed for consistency with planning decisions and evaluated under requirements of the NEPA and other applicable laws for resource protection. Mitigation needed to avoid adverse impacts will be integrated into project proposals and, where appropriate, alternatives identified to further reduce environmental impacts to lands, resources, or adjacent land uses. New utility lines and long-distance transmission lines will be designed and located so as to reduce visual impacts to travelers along I-15 and visually sensitive highways in the county.

Alternative A traverses areas considered to be Desert Tortoise Critical Habitat; however, the reference line would be located within the designated utility corridor and resource mitigation and avoidance would be used to the extent practical to minimize the conflict. Therefore, a plan amendment would not be needed.

4.4.13 BLM Caliente Field Office

Alternatives A, B (Agency Preferred), and C traverse the Caliente FO and mostly follow utility corridors designated through WWEC or the RMP. According to the RMP (RMP ROD, p. 65), “ROW and other land uses are recognized as major uses of the public lands and are authorized pursuant to Sections 302 and 501 of FLPMA. Section 503 of the FLPMA provides for the designation of utility corridors and encourages utilization of ROW in-common to minimize environmental impacts and the proliferation of separate ROW. It is BLM policy to encourage prospective applicants to locate their proposals within corridors. Only facilities and uses that are consistent with the special designation associated with that area will be permitted in avoidance areas. Designation of exclusion zones—those areas where no new ROW will be allowed—will provide protection of lands and resources with values that are not compatible with ROW or other land uses.”

Alternatives A, B, and C would not be able to meet visual quality objectives as determined through the TWE impact analysis in Section 3.12. However, these areas are situated within a utility corridor designated through WWEC and the RMP, and exceptions to visual resource conflicts could be granted if mitigation and avoidance is not feasible. While the 2-mile corridor that may be used for access roads encompasses ROW exclusion areas associated with one designated wilderness area and ROW exclusion areas associated with an ACEC, utilities and associated access could be routed to avoid these areas. Therefore, a plan amendment would not be required.

Due to the spacing constraints within the utility corridor along U.S Highway 93, the reference line for Alternative C is situated within a ROW exclusion area and the 2-mile corridor encompasses multiple ROW exclusions areas. Approximately 9 miles of the Alternative C reference line would cross the 57,190-acre Kane Springs ACEC exclusion area, and an amendment would be needed to expand the ROW corridor through this area. While the 2-mile corridor that may be used for access roads encompasses ROW exclusion areas associated with two designated wilderness areas, five proposed wilderness areas and one NWR, access roads could be routed to minimize or avoid these areas.

For Alternative C, Map 23 and Table 26 (p. 115 and 119) associated with RMP decision SD-3 would be amended as follows for 9 miles ***(new text in bold italics)***:

Table 26
Management Prescriptions for ACECs

Kane Springs (57,190 acres)	
Management Activities	**Management Prescriptions**
Land Use Authorization	Limited[9]/avoidance[2]/exclusion area***[15]***

[15] A one-time exception is granted to accommodate one high-voltage transmission line through the ROW exclusion area adjacent to U.S. Highway 93

4.4.14 BLM Las Vegas Field Office

Alternatives A (Agency Preferred Alternative), B, C and the Sunrise Mountain Alternative Connector would not meet resource objectives as noted below; however, a plan amendment would only be required for Alternative A and the Sunrise Mountain Alternative Connector.

Alternative B would not meet resource objectives that establish buffers to protect water resources and visual objectives as determined through the TWE impact analysis in Section 3.12. Alternative C would not meet visual objectives as determined through the TWE impact analysis in Section 3.12. The transmission line can be designed to avoid the water resource buffers and access roads routed to minimize conflict. In addition, these alternatives are situated within utility corridors designated through WWEC and the LRMP, and exceptions to visual resource conflicts could be granted if mitigation and avoidance is not feasible. Therefore, a plan amendment would not be required for Alternatives B and C.

Alternative A would cross the Muddy River and Alternative B would cross both the Muddy River and Meadow Valley Wash. These rivers were determined to be eligible for inclusion in the Wild and Scenic River system with tentative classifications of recreational for the Muddy River and scenic for Meadow Valley Wash. However, since these rivers are not addressed in the current RMP, a plan amendment would not be required.

Alternative A and the Sunrise Mountain Alternative Connector would pass through the Sunrise Mountain ISA, an exclusion area. An existing ROW corridor would need to be expanded adjacent to existing utilities for Alternative A. For the Sunrise Mountain Alternative Connector, a one-time exception would be needed to allow the transmission line to cross a small area north of the Lake Mead National Recreation Area boundary.

For Alternative A (Agency Preferred Alternative), RMP decision RW-1-a (RMP ROD, p. 19) in the RMP would be amended as follows for 1 mile ***(new text in bold italics)***:

1. A corridor 1,400 feet wide from the north side of the Sunrise ISA south through Rainbow Gardens to the Lake Mead crossover is designated. ***A one-time exception to expand the***

existing corridor up to 1-mile wide is granted to accommodate one high-voltage transmission line.

This corridor is described as west of the east boundary of the IPP-McCullough powerlines. Activation and use of this corridor ***or the one-time exception*** is contingent upon Congressional action releasing the ISA from further wilderness consideration and study.

For the Sunrise Mountain Alternative Connector, RMP decision RW-1-a (RMP ROD, p. 19) in the RMP would be amended as follows for 1 mile ***(new text in bold italics)***:

1. A corridor 1,400 feet wide from the north side of the Sunrise ISA south through Rainbow Gardens to the Lake Mead crossover is designated. This corridor is described as west of the east boundary of the IPP-McCullough powerlines.

   A one-time exception to designate a 1,500 feet wide, east-west utility corridor along the southeast edge of the Sunrise Mountain ISA adjacent to the Lake Mead National Recreation Area boundary is granted to accommodate one high-voltage transmission line.

   Activation and use of this corridor ***or the one-time exception*** is contingent upon Congressional action releasing the ISA from further wilderness consideration and study.

4.4.15 USFS Ashley National Forest

Alternatives E and F pass through the Ashley National Forest. Proposed routes through this area were determined to meet standards and guidelines and are considered to be in conformance with the LRMP. The LRMP did not formally identify ROW corridors and ROW requests are processed on a case-by-case basis following the NEPA process based on a demonstrated need and only after assurance that the use is properly coordinated with other resources and within land capabilities. Alternative E passes through the Sowers Canyon area that was recommended to be incorporated into the South Unit planning utility window; however, this recommendation was never formally adopted in the approved plan. The Sowers Canyon evaluation contained in the LRMP concluded that there was no land use plan conflict and that all conflicts with resource values could be mitigated. Although the USFS has not identified any plan amendments for the alternative route at this time, the USFS may identify plan amendments in response to additional information learned through the EIS process to fulfill the intent of standards and guidelines in the areas affected.

4.4.16 USFS Uinta National Forest

Alternatives A, E, and F pass through the Uinta National Forest. Proposed routes through this area were determined to meet standards and guidelines except as noted and are considered to be in conformance with the LRMP. Routes through this area follow utility corridors designated by WWEC or the LRMP. Alternatives A, E, and F conflict with standards establishing buffers for riparian habitat conservation areas; however, the transmission line can be designed to avoid the area and access roads routed to minimize conflict. The point where Alternatives A, E, and F converge in the Uinta National Forest would not be able to meet visual quality objectives as determined through the TWE impact analysis in Section 3.12, Visual Resources. However, this area is situated within a utility corridor designated through WWEC and the LRMP, and exceptions to visual resource conflicts could be granted if mitigation and avoidance is not feasible. Alternatives A, E, and F use the existing Deseret Generating and Transmission utility corridor designated in the LRMP, which limits use to currently permitted power transmission facilities (in MA-8.2-4 Standard). In addition, the FEIS associated with the LRMP states that requests for infrastructural developments on National Forest System lands would only be considered if the need

cannot be satisfied on lands under other ownership. Generally, additional infrastructure facilities would be limited as much as possible to existing utility corridors and sites. Since Alternatives A, E, and F would be situated within utility corridors designated by WWEC or the LRMP, a plan amendment would not be required. Although the USFS has not identified any plan amendments for the alternative route at this time, the USFS may identify plan amendments in response to additional information learned through the EIS process to fulfill the intent of standards and guidelines in the areas affected.

4.4.17 USFS Manti-La Sal National Forest

Alternatives A, B, C, D, E, and F pass through the Manti-La Sal National Forest; all routes follow utility corridors designated by WWEC or the LRMP. Proposed routes through this area were determined to meet standards and guidelines with the one exception noted and are considered to be in conformance with the LRMP. At the northern edge of the Manti-La Sal National Forest near the county line east of Nephi, the point where Alternatives A, B, C, D, E, and F converge would not meet visual quality objectives as determined through the TWE impact analysis in Section 3.12. However, this point is at the forest edge and would mostly be situated on private lands and a plan amendment would not be required to resolve the visual resource conflict.

According to the LRMP (Appendix D, p. D-2), “energy transportation proposals and applications for locations outside of corridors (within avoidance areas) would be subject to possible denial, if mitigation measures could not provide for adequate protection of sensitive/critical resource values. Proposals and applications for locations within avoidance or unclassified areas would be evaluated on a case-by-case basis. Approval of proposals/applications with adequate mitigations may be possible from such evaluations.” Although the USFS has not identified any plan amendments for the alternative route at this time, the USFS may identify plan amendments in response to additional information learned through the EIS process to fulfill the intent of standards and guidelines in the areas affected.

4.4.18 USFS Fishlake National Forest

Alternatives B, C, and F pass through the Fishlake National Forest. According to the LRMP (Appendix G, p. G-8), “there are no areas on the Fishlake National Forest with legislation prohibiting transmission facilities.” The alternatives were determined to meet standards and guidelines except as noted for visual resources.

Alternatives B and F would traverse an area of High SIO and an area that would not meet visual management objectives as determined as determined through the TWE impact analysis in Section 3.12. However, the area is situated within a utility corridor designated through the LRMP (the Lynndyl to Mona utility corridor) and exceptions to visual resource conflicts could be granted if mitigation and avoidance is not feasible. Therefore, a plan amendment would not be required for Alternatives B and F.

Alternative C traverses two small areas of High SIO and areas that would not meet visual management objectives as determined as determined through the TWE impact analysis in Section 3.12. The route cannot be relocated to avoid crossing these areas. One of these areas is within a utility corridor and window as shown in the North Half Utilities and Transportation Management map in the LRMP. A plan amendment would be required to widen the utility corridor and window south of I-70 to bring the project in conformance for Alternative C.

For Alternative C, plan amendment language would be added to the LRMP to widen the corridor width for the Huntington/Hunter – Sigurd, 345 kv, Trough Hollow to Sigurd Segment, in *Table F Summary of Management Direction For Existing Electrical Transmission Line And Highway Routes and Planning Windows* (p. G-29) as follows ***(new text in bold italics)***:

1. Electrical Transmission Line Routes	Corridor Designation	Type of Facility	Width of Corridor	Adjacent N.F. Land Designation
d. Huntington/Hunter – Sigurd, 345 kv Trough Hollow to Sigurd Segment	Yes	Overhead Only***, up to 600 kV***	Lateral distance of Trough Hollow or lateral distance of most stable landforms in Gooseberry Valley, whichever is the least distance***, up to 2 miles***	Gooseberry-Fishlake-Hilgard and Old Woman-Willow Creek Avoidance Area

In addition, text would be added under *C. Management Requirements, Visual Resource Management (A04)* (p. IV-14) as follows for 22 miles ***(new text in bold italics)***:

> 7. Choose facility and structure design, color of materials, location and orientation to meet the adopted visual quality objective(s) for the management area. ***In areas where utility corridors and windows are designated, exceptions to visual quality objectives and scenic integrity objectives will be allowed if mitigation or avoidance is not possible.***

Although the USFS has identified the plan amendment described for the alternative route at this time, the USFS may identify additional plan amendments in response to additional information learned through the EIS process to fulfill the intent of standards and guidelines in the areas affected.

4.4.19 USFS Dixie National Forest

Alternative A as well as the Ox Valley East, Ox Valley West, and Pinto Alternative Variations pass through the Dixie National Forest. Proposed routes through this area were determined to meet standards and guidelines except as noted and are considered to be in conformance with the LRMP. The Ox Valley East, Ox Valley West, and Pinto Alternative Variations pass through ROW Avoidance Areas and areas that would not meet visual management objectives as determined as determined through the TWE impact analysis in Section 3.12. Alternative A follows a WWEC corridor. Portions of these alternatives traverse areas designated as primitive motorized and semi-primitive non-motorized ROS; however, exceptions to visual and recreation use conflicts could be granted if mitigation and avoidance is not feasible. Therefore, USFS determined that a plan amendment would not be required. Although the USFS has not identified any plan amendments for the alternative route at this time, the USFS may identify plan amendments in response to additional information learned through the EIS process to fulfill the intent of standards and guidelines in the areas affected.

4.5 Analysis of Environmental Impacts and Planning Implications

This section presents an analysis of the environmental impacts and planning implications that would be associated with approval of the land use plan amendments, as described in the previous sections. Pursuant to federal regulations, this analysis is limited to the portions of the land use plans being considered for amendment.

Under all alternatives, plan amendments for the following BLM FOs would not be needed: Grand Junction, Moab, Richfield, Fillmore, Cedar City, and St. George. Under all alternatives, plan amendments for the following National Forests would not be needed: Uinta, Manti La-Sal, Ashley, and Dixie. The analysis for plan amendments needed by alternative is presented in the following sections.

4.5.1 Climate and Air Quality

There would be little or no impacts on air resources from plan amendment decisions. Plan amendments to create new or expand existing utility corridors would influence the ability to locate utilities in areas. These actions in turn would have direct impacts on air resources, which would be analyzed pursuant to NEPA process as individual projects are proposed. Consistency with current air quality regulations in

Wyoming, Colorado, Utah, or Nevada would need to be assessed as future projects are proposed along with the potential for individual projects to exceed applicable state or federal air quality standards and meet conformity requirements. Section 3.1 provides a detailed description of impacts to air resources within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.1.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The proposed plan amendments would have minor and inconsequential effects for the following areas because the areas are in attainment for air quality related values: BLM Rawlins FO, BLM Little Snake FO, and BLM Vernal FO. Only areas that may have air quality impact concerns for the plan amendment under this alternative are discussed in the following section.

BLM Las Vegas Field Office (Agency Preferred Alternative)

A BLM RMP plan amendment expanding an existing utility corridor, for a length of 1 mile, to allow for more utilities through the Sunrise Mountain ISA in the Las Vegas FO area would have minor and inconsequential effects under current conditions as stated above. Effects from any future authorized projects would be of slightly more concern in this area because a portion of Clark County is a nonattainment area for ozone (8-hour) and dust (particulate matter, PM_{10} [24-hour]).

4.5.1.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The proposed plan amendments would have minor and inconsequential effects for the following areas because the areas are in attainment for air quality related values: BLM Rawlins FO, BLM Little Snake FO, BLM White River FO, BLM Vernal FO, and BLM Price FO. There are no areas with air quality impact concerns for the plan amendments under this alternative.

4.5.1.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The proposed plan amendments would have minor and inconsequential effects for the following areas because the areas are in attainment for air quality related values: BLM Rawlins FO, BLM White River FO, BLM Vernal FO, BLM Price FO, BLM Caliente FO, and USFS Fishlake National Forest. There are no areas with air quality impact concerns for the plan amendments under this alternative.

4.5.1.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on climate and air quality in the respective areas is discussed in the following sections. The proposed plan amendments would have minor and inconsequential effects for the following FOs because the area is in attainment for air quality related values: BLM Rawlins FO, BLM Little Snake FO, and BLM Vernal FO.

4.5.1.5 Alternative E

The Alternative E route would require plan amendments involving one BLM office—Vernal. The proposed plan amendment would have minor and inconsequential effects in the BLM Vernal FO because the area is in attainment for air quality related values.

4.5.1.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The proposed plan amendments would have minor and inconsequential effects for both of these areas since they are in attainment for air quality related values.

4.5.1.7 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs: Rawlins and Las Vegas. The proposed plan amendments would have minor and inconsequential effects in the BLM Rawlins FO because the area is in attainment for air quality related values. Only areas that may have air quality impact concerns for the plan amendment under this alternative are discussed in the following section.

BLM Las Vegas Field Office

A one-time exception to allow the Sunrise Mountain Alternative Connector route, for a length of 1 mile, would have similar effects to climate and air quality as described for Alternative A above.

4.5.1.8 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The proposed plan amendment for the Emma Park Alternative Variation would have minor and inconsequential effects in the BLM Salt Lake FO because the area is in attainment for air quality related values.

4.5.2 Geological, Paleontological, and Mineral Resources

Section 3.2 provides a detailed description of impacts to geological, paleontological, and mineral resources within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.2.1 Paleontological Resources

There would be little or no impacts on paleontological resources from plan amendment decisions. Plan amendments to create new utility or expand existing corridors would influence the ability to locate utilities in areas. These actions in turn have direct impacts on paleontological resources, which are analyzed pursuant to NEPA as individual projects are proposed. Allowing for potential future utilities to be developed in areas where currently none exist could increase the likelihood of unanticipated subsurface discoveries. Any development activities in the proximity of high potential fossil yield areas could degrade the value of a site.

Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The effect these plan amendments would have on the management of paleontological resources in the respective FOs is discussed below.

BLM Rawlins Field Office

There are a number of important fossil bearing formations in the area. Expanding an existing and designating a new utility corridor for a length of 58 miles would increase the potential for discovering or disturbing paleontological resources. A total of 53,620 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM Little Snake Field Office

The only outstanding fossil resource in the area is Dinosaur National Monument, located a few miles east of Vernal, Utah. The majority of the 42 miles of new utility corridor overlaps category III (moderate or unknown potential) and V (very high potential) Potential Fossil Yield Classification (PFYC) areas; however, there is some overlap with PFYC II (low potential) areas. A total of 31,954 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM Vernal Field Office

There are a number of important fossil bearing formations in the area. Expanding an existing and designating a new utility corridor for a length of 19 miles would increase the potential for discovering or disturbing paleontological resources. A total of 9,182 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM Las Vegas Field Office (Agency Preferred Alternative)

This area does not have formations with high fossil potential. While expanding an existing utility corridor for a length of 1 mile would increase the potential for discovering or disturbing paleontological resources, these impacts would not be likely given the low potential of the area.

Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. No national forests require plan amendments under this alternative. The effect these plan amendments would have on the management of paleontological resource in the respective FOs is discussed below.

BLM Rawlins Field Office

There are a number of important fossil bearing formations in the area. Effects for the 61 miles of new utility corridor would be similar to those described for Alternative A. A total of 51,439 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM Little Snake Field Office

There is an outstanding fossil resource in the area at Dinosaur National Monument, located a few miles east of Vernal, Utah. The majority of the 37 miles of new utility corridor overlaps category III and V PFYC areas; however, there is some overlap with PFYC II areas. A total of 51,710 acres of potential fossil yield Class 5 areas would be overlapped by the amended area. Effects would be similar to those described for Alternative A.

BLM White River Field Office

There are a number of important fossil bearing formations in the area. Expanding and converting an existing utility corridor for 38 miles would increase the potential for discovering or disturbing paleontological resources. A total of 46,907 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM Vernal Field Office

There are a number of important fossil bearing formations in the area. Effects of designating 6 miles of new utility corridor would be similar to those described for Alternative A. A total of 2,001 acres of potential fossil yield Class 5 would be overlapped by the amended area.

BLM Price Field Office

There are a number of important fossil bearing formations in the area and an outstanding fossil resource in the area at Cleveland Lloyd Dinosaur Quarry, located a few miles south of the utility corridor. Designating a new utility corridor for 14 miles would increase the potential for discovering or disturbing paleontological resources. A total of 4,821 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. The effect these plan amendments would have on the management of paleontological resources in the respective BLM offices and national forest is discussed below.

BLM Rawlins Field Office

There are a number of important fossil bearing formations in the area. Effects for the 27 miles of new utility corridor would be similar to those described for Alternative A. A total of 16,013 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM White River Field Office

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Impacts would be the same as Alternative B.

BLM Price Field Office

There are a number of important fossil bearing formations in the area and an outstanding fossil resource in the area at Cleveland Lloyd Dinosaur Quarry, located a few miles north of the utility corridor. Designating a new utility corridor for 10 miles would increase the potential for discovering or disturbing paleontological resources. A total of 4,829 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM Caliente Field Office

This area does not have formations with high fossil potential. While expanding an existing utility corridor for 9 miles would increase the potential for discovering or disturbing paleontological resources, these impacts would not be likely given the low potential of the area.

USFS Fishlake National Forest

There are a number of important fossil bearing formations in the area. Designating a new utility corridor for 22 miles would increase the potential for discovering or disturbing paleontological resources. There are no potential fossil yield Class 5 areas that would be overlapped by the amended area. A total of 7,012 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on the management of paleontological resources in the respective BLM offices is discussed below.

BLM Rawlins Field Office (Agency Preferred Alternative)

There are a number of important fossil bearing formations in the area. Effects for the 76 miles of new utility corridor would be similar to those described for Alternative A. A total of 71,719 acres of potential fossil yield Class 5 areas would be overlapped by the amended area.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

There are a number of important fossil bearing formations in the area. Effects of designating 17 miles of new utility corridor would be similar to those described for Alternative A. A total of 9,121 acres of potential fossil yield Class 5 would be overlapped by the amended area.

Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on the management of paleontological resources in the respective BLM office is discussed below.

BLM Vernal Field Office

There are a number of important fossil bearing formations in the area. Effects of designating 6 miles of new utility corridor would be similar to those described for Alternative A. A total of 2,442 acres of potential fossil yield Class 5 would be overlapped by the amended area.

Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on the management of paleontological resources in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

There are a number of important fossil bearing formations in the area. Effects of designating 22 miles of new utility corridor would be similar to those described for Alternative A. A total of 11,011 acres of potential fossil yield Class 5 would be overlapped by the amended area.

BLM Salt Lake Field Office (Agency Preferred Alternative)

There are a number of important fossil bearing formations in the area. Effects of designating 3 miles of new utility corridor would be similar to those described for Alternative A. A total of 2,296 acres of potential fossil yield Class 5 would be overlapped by the amended area.

Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. Effects of designating 3 miles of new utility corridor would be similar to those described for Alternative A. A total of 2,523 acres of potential fossil yield Class 5 would be overlapped by the amended area.

Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on paleontological resources management in the respective FOs is discussed below.

BLM Rawlins Field Office

There are a number of important fossil bearing formations in the area. Effects for designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile Point South (2 miles), and Mexican Flats (9 miles) alternative connectors would be similar to those described for Alternative A. Potential follies yield Class 5 areas overlapped by the amended areas include: Baggs (24,139 acres), Fivemile Point North (1,928 acres), Fivemile Point South (999 acres), and Mexican Flats (7,006 acres).

BLM Las Vegas Field Office

This area does not have formations with high fossil potential. While expanding an existing utility corridor for 1 mile would increase the potential for discovering or disturbing paleontological resources, these impacts would not be likely given the low potential of the area. Only 3 acres of potential fossil yield Class 5 would overlap with the amended area.

4.5.2.2 Mineral Resources

Allowing for potential future development of utilities in areas where currently none exist could affect the management of mineral resources. A potential impact would be the loss of access to mineral resources and prevention of the mineral owner (including governmental entities) to develop minerals. Where the corridor is co-located with existing utility or transportation routes, it is expected to have a minimal impact on access to and development of mineral resources.

Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The effect these plan amendments would have on the management of mineral resources in the respective FOs is discussed below.

BLM Rawlins Field Office

The 58 miles of newly designated utility corridor would pass through areas leased for mineral development and active operations. The utility corridor traverses areas open to leasing with standard stipulations and minor constraints as well as some areas of major constraints for fluid minerals. There are mineral withdrawal areas south of I-80. The remaining land within the utility corridor is available for other minerals; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Little Snake Field Office

The utility corridor traverses areas open to leasing with minor constraints. The land within the 42-mile utility corridor is available for other minerals; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Vernal Field Office

The FO is entirely contained within the Uinta Basin, which is known nationally for oil and gas production. The Vernal RMP and ROD prioritize the development of mineral resources while protecting other valuable natural resources. The 19-mile utility corridor traverses areas open to leasing with standard stipulations for fluid minerals. The land within the utility corridor is available for other minerals; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Las Vegas Field Office (Agency Preferred Alternative)

Since the development of mineral resources is not permitted within the Rainbow Gardens ACEC, which overlaps the Sunrise ISA, impacts to mineral resources would not be anticipated, due to the 1-mile amended area.

Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. The effect these plan amendments would have on the management of mineral resources in the respective FOs is discussed below.

BLM Rawlins Field Office

The 61-mile utility corridor includes areas leased for mineral development and active operations. The utility corridor traverses areas open to leasing with standard stipulations and minor constraints as well as some areas of major constraints for fluid minerals. There are mineral withdrawal areas south of I-80. The remaining land within the utility corridor is available for other minerals; however, there is no active mineral activity. Conversion and expansion of the underground-only corridor would expand the area where utilities could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Little Snake Field Office

The 37-mile utility corridor traverses areas open to leasing with minor constraints for fluid minerals. The land within the utility corridor is available for other minerals; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM White River Field Office

The 38-mile utility corridor traverses areas open to leasing with standard stipulations and minor constraints for fluid minerals. There are no other mineral resources affected. Conversion and expansion of the underground-only corridor would expand the area where utilities could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Vernal Field Office

The 6-mile utility corridor traverses areas open to leasing with standard stipulations for fluid minerals. The land within the utility corridor is available for other mineral activity; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources, as discussed under Alternative A. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Price Field Office

The 14-mile utility corridor traverses areas open to leasing with standard stipulations for fluid minerals. No areas of tar sands, oil shale, or coal reserves are affected. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. The effect these plan amendments would have on managing mineral resources in the respective BLM offices and national forest is discussed below.

BLM Rawlins Field Office

The 27-mile utility corridor includes areas leased for mineral development and active operations. The utility corridor traverses areas open to leasing with standard stipulations and minor constraints as well as some areas of major constraints. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM White River Field Office

Effects to minerals management as a result of expanding and converting an existing underground-only corridor would be the same as described for Alternative B.

BLM Vernal Field Office

Effects to minerals management as a result of designating a new utility corridor would be the same as described for Alternative B.

BLM Price Field Office

The 10-mile utility corridor traverses areas open to leasing with standard stipulations. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Caliente Field Office

Mineral resources development is not permitted within the Kane Springs ACEC; therefore, there would be no impact to mineral resources management due to the corridor location.

USFS Fishlake National Forest

Because the 22-mile ROW is co-located with an existing transportation and utility corridor, it is unlikely to interfere with mineral resources management. Allowing exceptions to the SIO designation could also reduce visual mitigation restrictions on mineral resources development.

Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on managing mineral resources in the respective BLM offices is discussed below.

BLM Rawlins Field Office (Agency Preferred Alternative)

The 76-mile utility corridor includes areas leased for mineral development and active operations. The utility corridor traverses areas open to leasing with standard stipulations and minor constraints as well as some areas of major constraints. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

The 17-mile utility corridor traverses areas open to leasing with standard stipulations for fluid minerals. The land within the utility corridor is available for other mineral activity; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources, as discussed under Alternative A. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Alternative E

The Alternative E route would require plan amendments involving one BLM offices—Vernal. The effect these plan amendments would have on managing mineral resources in the respective BLM office is discussed below.

BLM Vernal Field Office

The 6-mile utility corridor traverses areas open to leasing with standard stipulations for fluid minerals. The land within the utility corridor is available for other mineral activity; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources, as discussed under Alternative A. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on the managing mineral resources in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22-mile utility corridor traverses areas open to leasing with standard stipulations for fluid minerals. The land within the utility corridor is available for other mineral activity; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources, as discussed under Alternative A. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3-mile utility corridor traverses areas open to leasing with standard stipulations for fluid minerals. The land within the utility corridor is available for other minerals; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation traverses areas open to leasing with standard stipulations for fluid minerals. The land within the utility corridor is available for other minerals; however, there is no active mineral activity. Concentrating utilities in this area could compete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on the management of mineral resources in the respective FOs is discussed below.

BLM Rawlins Field Office

Effects for the designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile South (2 miles), and Mexican Flats (9 miles) alternative connectors would be similar to those described for Alternative A. These alternative connectors traverse areas open to leasing with minor constraints as well as some areas of major constraints. Concentrating utilities in this area could complete with the ability to access and develop mineral resources. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

BLM Las Vegas Field Office

Since the development of mineral resources is not permitted within the Rainbow Gardens ACEC, which overlaps the Sunrise ISA, impacts to mineral resources would not be anticipated.

4.5.3 Soil Resources

No direct effect would occur to soil resources from plan amendments; however, effects could occur from changes to land management that would allow and/or encourage new utility project development such as the establishment of new designated or expanded utility corridors. Development of additional utility projects within new utility corridors or development of additional ROWs would result in direct and indirect impacts to soil resources. Impacts could occur from short-term increases of erosion rates within disturbed areas, potential creation of unstable soil conditions at excavated areas, and soil contamination from leaks and spills. Impacts also could occur from short-term increases in upland erosion. These impacts would be analyzed on a project-by-project basis, and are discussed in detail for the TWE Project in Section 3.3, Soils, of this EIS.

4.5.3.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

The 58 miles of newly designated utility corridor would pass through areas with sensitive soils. The amended area would overlap with 39,888 acres of soil designated as highly erodible and 47,912 acres that are designated as prone to compaction. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Little Snake Field Office

The 42 miles of utility corridor that would require a plan amendment would overlap with 27,122 acres of soil designated as highly erodible, 19,473 acres that are designated as prone to compaction, and 2,985 acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Vernal Field Office

The 19 miles of utility corridor that would require a plan amendment would overlap with 3,254 acres of soil designated as highly erodible, 9,891 acres that are designated as prone to compaction, and 811 acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Las Vegas Field Office (Agency Preferred Alternative)

The one mile of utility corridor that would require a plan amendment would overlap with 20 acres of soil designated as highly erodible. Concentrating utilities in this area could compromise soil stability.

4.5.3.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

The 61 miles of utility corridor that would require a plan amendment would pass through areas with sensitive soils. The amended area would overlap with 48,559 acres of soil designated as highly erodible and 47,133 acres that are designated as prone to compaction. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Little Snake Field Office

The 37 miles of utility corridor that would require a plan amendment would overlap with 34,418 acres of soil designated as highly erodible, 26,441 acres that are designated as prone to compaction, and 4,649 acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

BLM White River Field Office

The 38 miles of utility corridor that would require a plan amendment would overlap with 349 acres of soil designated as highly erodible, 26,854 acres that are designated as prone to compaction, and 3,815 acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Vernal Field Office

The 6 miles of utility corridor that would require a plan amendment would overlap with 14 acres of soil designated as prone to compaction. Concentrating utilities in this area could compromise soil productivity.

BLM Price Field Office

The 14 miles of utility corridor that would require a plan amendment would overlap with 5,895 acres of soil designated as highly erodible, 13,819 acres that are designated as prone to compaction, and 682 acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

4.5.3.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

The 27 miles of utility corridor that would require a plan amendment would pass through areas with sensitive soils. The amended area would overlap with 11,965 acres of soil designated as highly erodible, 17,106 acres that are designated as prone to compaction, and 199 acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

BLM White River Field Office

Impacts would be the same as for Alternative B.

BLM Vernal Field Office

Impacts would be the same as for Alternative B.

BLM Price Field Office

The 10 miles of utility corridor that would require a plan amendment would overlap with 609 acres of soil designated as highly erodible and 6,085 acres that are designated as prone to compaction. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Caliente Field Office

The nine miles of utility corridor that would require a plan amendment would overlap with 118 acres of soil designated as highly erodible. Concentrating utilities in this area could compromise soil stability.

USFS Fishlake National Forest

The 22 miles of utility corridor that would require a plan amendment would overlap with 10,805 acres of soil designated as highly erodible, 21,061 acres that are designated as prone to compaction, and 1 acre of prime farmland. The corridor would be co-located with an existing transportation and utility corridor; however, concentrating utilities in this area could compromise soil stability and productivity.

4.5.3.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office (Agency Preferred Alternative)

The 76 miles of utility corridor that would require a plan amendment would pass through areas with sensitive soils. The amended area would overlap with 40,511 acres of soil designated as highly erodible and 58,172 acres that are designated as prone to compaction. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as for Alternative B.

BLM Vernal Field Office

The 17 miles of utility corridor that would require a plan amendment would overlap with 4,696 acres of soil designated as highly erodible and 9,178 acres designated as prone to compaction. Concentrating utilities in this area could compromise soil stability and productivity.

4.5.3.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Vernal Field Office

The 6 miles of utility corridor that would require a plan amendment would overlap with 335 acres of soil designated as highly erodible, 2,999 acres designated as prone to compaction, and 506 acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

4.5.3.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on the managing soil resources in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22-mile utility corridor that would require a plan amendment would overlap with 4,618 acres of soil designated as highly erodible and 11,090 acres designated as prone to compaction. Concentrating utilities in this area could compromise soil stability and productivity.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3-mile utility corridor that would require a plan amendment would overlap with 275 acres of soil designated as highly erodible, 2,239 acres designated as prone to compaction, and four acres of prime farmland. Concentrating utilities in this area could compromise soil stability and productivity.

4.5.3.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation that would require a plan amendment would overlap with 107 acres of soil designated as highly erodible and 2,723 acres designated as prone to compaction. Concentrating utilities in this area could compromise soil stability and productivity.

4.5.3.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

Designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile South (2 miles), and Mexican Flats (9 miles) alternative connectors would pass through areas with sensitive soils. The areas requiring a plan amendment would overlap with soil designated as highly erodible (Baggs—17,393 acres, Mexican Flats—3,622 acres, and no areas for Fivemile Point North and South), soil designated as prone to compaction (Baggs—17,640 acres, Fivemile Point North—315 acres,

Fivemile Point South—816 acres, and Mexican Flats—6,675 acres). Only the Baggs Alternative Connector would overlap with soil designated as prime farmland (116 acres). Concentrating utilities in this area could compromise soil stability and productivity.

BLM Las Vegas Field Office

The 1 mile of utility corridor that would require a plan amendment would overlap with three acres of soil designated as highly erodible by water. The placement of utilities in this area could compromise soil stability and productivity.

4.5.4 Water Resources

No direct effect would occur to water resources from plan amendments; however, effects could occur from changes to land management that would allow and/or encourage new utility project development such as the establishment of new designated or expanded utility corridors. Development of additional utility projects within new utility corridors or development of additional ROWs would result in direct and indirect impacts to water resources. Impacts could occur from short-term increases of erosion rates within disturbed areas, potential creation of unstable soil conditions at excavated areas, increased suspended sediment concentrations below access road stream crossings, and water contamination from leaks and spills. Impacts also could occur from short-term increases from upland erosion contributing to suspended solids concentrations and sedimentation issues in streams. These impacts would be analyzed on a project-by-project basis, and are discussed in detail for the TWE Project in Section 3.4, Water Resources, of this EIS.

4.5.4.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

The 58 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 294 miles of intermittent streams and 316 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Little Snake Field Office

The 42 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 196 miles of intermittent streams and 4 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Vernal Field Office

The 19 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 46 miles of intermittent streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Las Vegas Field Office (Agency Preferred Alternative)

The 1 mile of utility corridor that would require a plan amendment would not cross or overlap with any intermittent or perennial streams or waterbodies.

4.5.4.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under these alternatives. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

The 61 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 320 miles of intermittent streams and 75 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Little Snake Field Office

The 37 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 223 miles of intermittent streams and 4 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM White River Field Office

The 38 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 211 miles of intermittent and 5 miles of perennial streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Vernal Field Office

The 6 miles of utility corridor that would require a plan amendment would cross or overlap with 12 miles of intermittent streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Price Field Office

The 14 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 51 miles of intermittent streams, 1 mile of perennial streams, and 11 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

4.5.4.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. Plan amendments for utility corridors could result in effects from potential additional development as stated above. Additional impacts are noted in the following sections.

BLM Rawlins Field Office

The 27 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 147 miles of intermittent streams, 17 miles of perennial streams, and 84 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation. Exceptions to surface water buffers may need to be granted if avoidance or minimization is not possible when siting utilities; however, overhead structures can span these areas and roads re-routed to the extent feasible.

BLM White River Field Office

Impacts would be the same as for Alternative B.

BLM Vernal Field Office

Impacts would be the same as for Alternative B.

BLM Price Field Office

The 10 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 40 miles of intermittent streams and 6 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Caliente Field Office

The 9 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with one mile intermittent streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

USFS Fishlake National Forest

The 22 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 51 miles of intermittent streams, 10 miles of perennial streams, and 27 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

4.5.4.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office (Agency Preferred Alternative)

The 76 miles of utility corridor that would require a plan amendment would cross or overlap with intermittent streams and various waterbodies. The amended area would overlap with 346 miles of intermittent streams and 472 acres of waterbodies. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as for Alternative B.

BLM Vernal Field Office

The 6 miles of utility corridor that would require a plan amendment would cross or overlap with 12 miles of intermittent streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

4.5.4.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Vernal Field Office

The 6 miles of utility corridor that would require a plan amendment would cross or overlap with 15 miles of intermittent streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

4.5.4.6 Alternative F

The Alternative F route would require a plan amendment involving two BLM offices—Vernal and Salt Lake. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22-mile utility corridor that would require a plan amendment would overlap with 30 miles of intermittent streams and 1 mile of perennial streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3-mile utility corridor that would require a plan amendment would overlap with 3 miles of intermittent streams and 2 miles of perennial streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

4.5.4.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation that would require a plan amendment would overlap with 3 miles of intermittent streams and 1 mile of perennial streams. Concentrating utilities in this area could result in reductions to water quality due to erosion and sedimentation.

4.5.4.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above. Additional impacts are noted in the following sections.

BLM Rawlins Field Office

Designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile South (2 miles), and Mexican Flats (9 miles) alternative connectors would overlap with intermittent streams, perennial streams, and waterbodies. The Baggs Alternative Connector would overlap with 84 miles of intermittent streams and 5 acres of water bodies. The Fivemile Point North Alternative Connector would overlap with 7 miles of intermittent streams. The Fivemile Point South Alternative

Connector would overlap with 5 miles of intermittent streams and 2 acres of water bodies. The Mexican Flats Alternative Connector would overlap with 36 miles of intermittent streams and 4 acres of water bodies. Exceptions to surface water buffers for the Mexican Flats and Fivemile Point North alternative connectors may need to be granted if avoidance or minimization is not possible when siting utilities; however, overhead structures can span these areas and roads re-routed to the extent feasible.

BLM Las Vegas Field Office

The 1 mile of utility corridor that would require a plan amendment would not cross or overlap with any intermittent or perennial streams or waterbodies.

4.5.5 Vegetation

Section 3.5 provides a detailed description of impacts to vegetation resources within the corridors proposed, plan amendment-specific impacts are addressed in the following sections. This section is subdivided into general vegetation, forest management, and fire and fuels management.

4.5.5.1 General Vegetation

Allowing for potential future development of utilities in areas where currently none exist could affect the vegetation composition and spread of noxious weeds. Vegetation could be removed temporarily during potential future project construction or the vegetation composition permanently altered for installation of project facilities. Surface disturbing activities, human presence, and wildland fires all have the potential to increase the spread of noxious and invasive weed species.

Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

The 58 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 200 acres of grassland, 1,293 acres of riparian and wetland communities, 64,417 acres of shrubland, 335 acres of forested, and 2,593 acres of sparsely vegetated or barren land. No agricultural land or pinyon/juniper would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Little Snake Field Office

The 42 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 6,659 acres of grassland, 8 acres of riparian and wetland communities, 41,137 acres of shrubland, 167 acres of agricultural land, 23 acres of pinyon/juniper, and 473 acres of sparsely vegetated or barren land. No forested areas would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Vernal Field Office

The 19 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 3 acres of agricultural land, 232 acres of grassland, 1,231 acres of pinyon/juniper, 8,994 acres of shrubland, 9 acres of riparian/wetland and 1,240 acres of sparsely vegetated or barren land. No forested areas would be within

the amended area. Concentrating utilities in this area would result in the replacement or alteration of vegetation within these community types.

BLM Las Vegas Field Office (Agency Preferred Alternative)

The 1 mile of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 4 acres of riparian and wetland communities, 26 acres of shrubland, and 3 acres of sparsely vegetated or barren land. No agricultural land, forested areas, grasslands, or pinyon/juniper would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments for utility corridors could result in effects from potential additional development as stated above. Additional impacts are noted in the following sections.

BLM Rawlins Field Office

Impacts from expansion of the existing corridor along I-80 and conversion of a utility corridor to allow overhead facilities south of I-80 would be the same as those stated above. Over time, development would temporarily or permanently alter the vegetation composition necessary for managing sage-obligate habitat. Known unique plant communities lie to the north and east of the corridor and would not be affected by the development of an aboveground utility corridor.

The 61 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 6 acres of agricultural land, 257 acres of forested areas, 197 acres of grassland, 1,200 acres of riparian and wetland communities, 62,567 acres of shrubland, and 2,076 acres of sparsely vegetated or barren land. No pinyon/juniper would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Little Snake Field Office

The 37 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 230 acres of agricultural land, 1 acre of forested land, 8 acres of pinyon/juniper, 8,478 acres of grassland, 3 acres of riparian and wetland communities, 49,411 acres of shrubland, and 829 acres of sparsely vegetated or barren land. No agricultural land, forested areas, or pinyon/juniper would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM White River Field Office

Impacts from expansion and conversion of a utility corridor to allow overhead facilities would be the same as those stated above. The northern portion of the corridor passes through a “weed free” area. Efforts to combat the invasion and spread of noxious weeds would likely need to be elevated to ensure this condition in, along, and near the corridor. In areas near the Oil Spring Mountain and White River Riparian ACECs, efforts will need to be elevated to ensure the protection of Remnant Vegetation Associations (vegetation species with the potential to be listed in the near future).

The 38 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 26 acres of agricultural land, 2,525 acres of forested areas, 606 acres of grassland, 19,736 acres of pinyon/juniper, 73 acres of riparian and wetland communities, 26,324 acres of shrubland, and 802 acres of sparsely vegetated or barren

land. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Vernal Field Office

The 6 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 102 acres of forested, 1,962 acres of pinyon/juniper, two acres of riparian and wetland, 288 acres of shrubland, and 83 acres of sparsely vegetated or barren land. No agricultural land or grassland would be in the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Price Field Office

The 14 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 48 acres of agricultural land, 573 acres of grassland, 700 acres of pinyon/juniper, 285 acres of riparian and wetland communities, 12,718 acres of shrubland, and 2,426 acres of sparsely vegetated or barren land. No forested areas would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. Plan amendments for utility corridors could result in effects from potential additional development as stated above. Additional impacts are noted in the following sections.

BLM Rawlins Field Office

The 27 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 2 acres of agricultural land, 123 acres of forested areas, 434 acres of grassland, 955 acres of riparian and wetland communities, 39,853 acres of shrubland, and 531 acres of sparsely vegetated or barren land. No pinyon/juniper would be within the amended area. Concentrating utilities in this area would result in the replacement or alteration of vegetation within these community types.

BLM White River Field Office

Effects would be the same as for Alternative B described above.

BLM Vernal Field Office

Effects would be the same as for Alternative B described above.

BLM Price Field Office

The 10 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 674 acres of grassland, 1,885 acres of pinyon/juniper, 3 acres of riparian and wetland communities, 5,714 acres of shrubland, and 3,453 acres of sparsely vegetated or barren land. No agricultural land or forested areas would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Caliente Field Office

The 9 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 4 acres of riparian and wetland communities and 274 acres of shrubland. No agricultural land, forested areas, grassland, pinyon/juniper, or sparsely vegetated or barren land would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

USFS Fishlake National Forest

The 22 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 35 acres of agricultural land, 2,749 acres of forested areas, 51 acres of grassland, 8,858 acres of pinyon/juniper, 373 acres of riparian and wetland communities, 8,873 acres of shrubland, and 904 acres of sparsely vegetated or barren land. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office (Agency Preferred Alternative)

The 76 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 7 acres of agricultural land, 441 acres of forested areas, 183 acres of grassland, 1,958 acres of riparian and wetland communities, 82,061 acres of shrubland, and 373 acres of sparsely vegetated or barren land. No pinyon/juniper would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as for Alternative B.

BLM Vernal Field Office

The 17 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with six acres of agricultural land, 384 acres of forested, 737 acres of grassland, 4,279 acres of pinyon/juniper, two acres of riparian and wetland, 2,380 acres of shrubland, and 1,281 acres of sparsely vegetated or barren land. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Vernal Field Office

The 6 miles of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with three acres of agricultural land, 12 acres of forested, 143 acres of grassland, 66 acres of pinyon/juniper, nine acres of riparian and wetland,

3,818 acres of shrubland, and 254 acres of sparsely vegetated or barren land. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on the managing vegetation resources in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22-mile utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with six acres of agricultural land, 1,668 acres of forested, 750 acres of grassland, 4,248 acres of pinyon/juniper, two acres of riparian and wetland, 2,960 acres of shrubland, and 1,315 acres of sparsely vegetated or barren land. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3-mile utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with three acres of agricultural land, 1,064 acres of forested, 59 acres of grassland, 88 acres of pinyon/juniper, 1,048 acres of shrubland, and 23 acres of sparsely vegetated or barren land. No areas of riparian and wetland would be affected. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 1,120 acres of forested, 53 acres of grassland, 28 acres of pinyon/juniper, 1,359 acres of shrubland, and 133 acres of sparsely vegetated or barren land. No areas of agricultural land or riparian and wetland would be affected. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

BLM Rawlins Field Office

Designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile South (2 miles), and Mexican Flats (9 miles) alternative connectors would overlap with several different vegetation community types. The Baggs Alternative Connector would overlap with 12 acres of agricultural land, 465 acres of forested land, 21 acres of grassland, 314 acres of riparian and wetland, 18,148 acres of shrubland, and 972 acres of sparsely vegetated or barren land; no areas of pinyon juniper would be affected. The Fivemile Point North Alternative Connector would overlap with two acres of grassland, 12 acres of riparian and wetland, 2,075 acres of shrubland, and 78 acres of sparsely vegetated or barren land; no areas of agricultural land, forested, or pinyon juniper would be affected. The Fivemile Point South Alternative Connector would overlap with eight acres of riparian and wetland and 987 acres of shrubland; no areas of agricultural land, grassland, forested, pinyon juniper, or sparsely vegetated or barren would

be affected. The Mexican Flats Alternative Connector would overlap with one acre of agricultural land, 142 acres of riparian and wetland, 7,276 acres of shrubland, and 961 acres of sparsely vegetated or barren land; no areas of grassland, forested, or pinyon juniper would be affected. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

BLM Las Vegas Field Office

The one mile of utility corridor that would require a plan amendment would overlap with several different vegetation community types. The amended area would overlap with 16 acres of shrubland and 14 acres of sparsely vegetated or barren land. No agricultural land, forested areas, grasslands, pinyon/juniper, or riparian and wetland communities would be within the amended area. Concentrating utilities in this area would result in the removal or alteration of vegetation within these community types.

4.5.5.2 Forest Management

Allowing for potential future utilities to be developed in areas where currently none exist could affect the management of forests. Corridor areas may influence the size and location of commercial timber harvesting. Initial ROW clearing and operational maintenance would result in a reduced fuel load and, therefore, incrementally reduce the potential for wildland fires in the area of the corridor. There would be a greater emphasis on fire suppression to protect the developed infrastructure within the corridor.

Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The proposed plan amendments would have minor and inconsequential effects for the following areas because the areas do not contain forested and woodland areas suitable for timber harvest: BLM Little Snake FO, and BLM Las Vegas FO. Only areas that may have forest management concerns for the plan amendment under this alternative are discussed in the following sections.

BLM Rawlins Field Office

Since all forested and woodland areas within the FO are open to commercial and noncommercial timber harvesting, the location of this corridor could potentially interfere with harvest operations in the Powder Rim area of the FO. However, given that the limited forest resources exist along the route, impacts to forest management would not be anticipated.

BLM Vernal Field Office

Some of these areas that would be crossed Alternative A are approved for woodcutting and the existence of the corridor could interfere with harvesting operations.

Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. The effect these plan amendments would have on forest management in the respective FOs is discussed below. The proposed plan amendments would have minor and inconsequential effects for the following areas because the areas do not contain forested and woodland areas suitable for timber harvest: BLM Little Snake FO, BLM White River FO, and BLM Price FO. Only areas that may have forest management concerns for the plan amendment under this alternative are discussed in the following section.

BLM Rawlins Field Office

Since all forested and woodland areas within the FO are open to commercial and noncommercial timber harvesting, the location of this corridor could potentially interfere with harvest operations in the Powder Rim area of the FO. However, given that the limited forest resources exist along the route, impacts to forest management would not be anticipated.

BLM Vernal Field Office

Some of the areas that are crossed by Alternative B are approved for woodcutting and the existence of the corridor could interfere with harvesting operations.

Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. The effect these plan amendments would have on forest management in the respective BLM offices and national forest is discussed below. The proposed plan amendments would have minor and inconsequential effects for the following areas because the areas do not contain forested and woodland areas suitable for timber harvest: BLM White River FO, BLM Price FO, BLM Caliente FO. Only areas that may have forest management concerns for the plan amendment under this alternative are discussed in the following sections.

BLM Rawlins Field Office

Since all forested and woodland areas within the FO are open to commercial and noncommercial timber harvesting, the location of this corridor could potentially interfere with harvest operations in the Powder Rim area of the FO. However, given that the limited forest resources exist along the route, impacts to forest management would not be anticipated.

BLM Vernal Field Office

Some of the areas that are crossed by Alternative C are approved for woodcutting and the existence of the corridor could interfere with harvesting operations.

USFS Fishlake National Forest

Timber harvest operations are active within the forest. The majority of the proposed utility corridor location follows a transportation corridor and the remainder is co-located with an existing transmission line. Expanding the utility corridor and allowing exception to the SIO could open the area for harvest or other types of development, which could interfere with harvest operations. However, the proposed utility corridor location does not cross any areas managed for production or forest management.

Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on forest management in the respective BLM offices is discussed below. The proposed plan amendments would have minor and inconsequential effects for the following area because the area does not contain forested and woodland areas suitable for timber harvest: BLM Little Snake FO. Only areas that may have forest management concerns for the plan amendment under this alternative are discussed in the following section.

BLM Rawlins Field Office (Agency Preferred Alternative)

Since all forested and woodland areas within the FO are open to commercial and noncommercial timber harvesting, the location of this corridor could potentially interfere with harvest operations in the Powder

Rim area of the FO. However, given that the limited forest resources exist along the route, impacts to forest management would not be anticipated.

BLM Vernal Field Office

Some of the areas that are crossed by Alternative D are approved for woodcutting and the existence of the corridor could interfere with harvesting operations.

Alternative E

The Alternative E route would require plan amendments involving one BLM office—Vernal.

BLM Vernal Field Office

Some of the areas that are crossed by Alternative E are approved for woodcutting and the existence of the corridor could interfere with harvesting operations.

Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The proposed plan amendment would have minor and inconsequential effects in the BLM Salt Lake FO because the area does not contain forested and woodland areas suitable for timber harvest. Only areas that may have forest management concerns for the plan amendment under this alternative are discussed in the following section.

BLM Vernal Field Office (Agency Preferred Alternative)

Some of the areas that are crossed by Alternative F are approved for woodcutting and the existence of the corridor could interfere with harvesting operations.

Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The proposed plan amendment would have minor and inconsequential effects in the BLM Salt Lake FO because the area does not contain forested and woodland areas suitable for timber harvest.

Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs: Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on forest management in the respective FOs is discussed below. The proposed plan amendments would have minor and inconsequential effects for the following area because the area does not contain forested and woodland areas suitable for timber harvest: BLM Las Vegas Office. Only areas that may have forest management concerns for the plan amendment under this alternative are discussed in the following section.

BLM Rawlins Field Office

Since all forested and woodland areas within the FO are open to commercial and noncommercial timber harvesting, the location of utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile Point South (2 miles), and Mexican Flats (9 miles) alternative connectors potentially could interfere with harvest operations in the Powder Rim area of the FO. However, given that the limited forest resources exist along the route, impacts to forest management would not be anticipated.

4.5.5.3 Fire and Fuels Management

Allowing for potential future utilities to be developed in areas where currently none exist could affect the management of fire and fuels. Benefits to fire and fuel management would include decreased fuel loads due to ROW clearing and maintenance, resulting in the potential for reduced fire size and intensity. The addition of access roads also could facilitate firefighting efforts. The inclusion of a utility corridor could eliminate the ability to use wildland fire for beneficial vegetation treatment and may increase the frequency of fire events due to additional human presence, vehicles, and equipment (ignition sources). The location of infrastructure would elevate the need to suppress fire in the utility corridor with this additional value at risk to wildland fire. If an RMP or LRMP does not state that wildland fire is being reintroduced to the ecosystem, then it is assumed that some level of suppression of wildland fire is the overall strategy of the land management agency.

Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The effect these plan amendments would have on fire and fuels management in the respective FOs is discussed below.

BLM Rawlins Field Office

The location of an aboveground transmission line in this area could have an effect on fire and fuels management because the area has been designated as suitable for the use of wildland fire as a resource benefit used to protect, maintain, and enhance vegetation resources and to allow fire to function in its natural ecological role. There would need to be an increased emphasis on fire suppression and post-fire restoration in the corridor area to protect the infrastructure and maintain public health and safety.

BLM Little Snake Field Office

As a whole, the Little Snake FO integrates wildland fire into the ecosystem as a natural process on a landscape scale. Development in a new utility corridor where currently no development exists could have an effect on fire and fuels management. Along the Alternative A route, a suppression response from fire management units to wildland fire may be necessary to prevent damage to the infrastructure and risks to public health and safety taking into consideration firefighter safety. This area would be precluded from the use of wildland fire as a vegetation treatment; however, the vegetation clearing and maintenance practices along the corridor may serve a similar role.

BLM Vernal Field Office

Prescribed and wildland fire is used within the FO as a method for reintroducing natural fire regimes to fire-adapt ecosystems; however, in the eastern portion of the FO, where Alternative A crosses public land, is a high fire risk area where fire is not desired. Introducing additional structures in this area may increase the potential for wildfire and associated suppression efforts required to control any fire starts. Any future transmission lines would need to meet design requirements to reduce the chances of fire in this high fire risk area.

BLM Las Vegas Field Office (Agency Preferred Alternative)

There is some use of prescribed fire within the Las Vegas FO; however, the vast majority of the FO is managed to suppress fire. Alternative A does not pass through any areas where fire is used for enhancement of vegetation communities.

Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. The effect these plan amendments would have on fire and fuels management in the respective FOs is discussed below.

BLM Rawlins Field Office

The Alternative B route has been designated as suitable for the use of wildland fire as a resource benefit used to protect, maintain, and enhance vegetation resources and to allow fire to function in its natural ecological role. Effects to fire and fuels management would be the same as for Alternative A described above.

BLM Little Snake Field Office

As a whole, the Little Snake FO integrates wildland fire into the ecosystem as a natural process on a landscape scale. Effects to fire and fuels management from the newly designated corridor would be the same as for Alternative A described above.

BLM White River Field Office

Wildland fire is used by the White River FO as a method for protecting, maintaining, and enhancing vegetation communities. Conversion and expansion of the existing utility corridor could have an effect on fire and fuels management within the FO. The corridor would constitute an area where additional fire suppression may be required to protect the infrastructure providing for public health and safety. Vegetation clearing and maintenance practices along the corridor may serve a similar role to fire in reducing fuel biomass.

BLM Vernal Field Office

In the eastern portion of the FO where Alternative B crosses public land, is a high fire risk area where fire is not desired. Therefore, Alternative B may not constitute an area where additional suppression efforts would be required.

BLM Price Field Office

Within the Price FO, wildland fire is the preferred method of vegetation treatment because it is considered to be less intrusive. Portions of Alternative B that extend outside of the utility corridor designated in the RMP equate to areas where wildland fire use would be precluded. In the absence of fire, mechanical, chemical, and biological methods are employed for vegetation treatments. The vegetation clearing and maintenance practices along the corridor would serve a similar role in reducing fuel loads.

Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. The effect these plan amendments would have on fire and fuels management in the respective BLM offices and national forest is discussed below.

BLM Rawlins Field Office

The Alternative C route has been designated as suitable for the use of wildland fire as a resource benefit used to protect, maintain, and enhance vegetation resources and to allow fire to function in its natural ecological role. Effects to fire and fuels management would be the same as for Alternative A described above.

BLM White River Field Office

Effects to fire and fuels management as a result of converting to an aboveground corridor would be the same as for Alternative B described above.

BLM Vernal Field Office

Effects to fire and fuels management from the newly designated corridor would be the same as for Alternative B described above.

BLM Price Field Office

Portions of Alternative C that extend outside of the utility corridor designated in the RMP equate to areas where wildland fire use would be precluded. Effects to fire and fuels management as a result of expanding the existing utility corridor would be the same as for Alternative B described above.

BLM Caliente Field Office

Within the Caliente FO, fire is being reintroduced as a natural component of the ecosystem. A one-time exception through the Kane Springs ACEC would equate to an increased level of fire suppression, particularly in high elevation areas where there tends to be a greater accumulation of fuel biomass.

USFS Fishlake National Forest

Some wildland fires are permitted to burn within the Fishlake National Forest. This would depend on the vegetation community type involved and the intensity of the fire. In areas intersected by Alternative C, this strategy would likely be precluded. Fire suppression would need to be prioritized in an effort to protect the infrastructure within the ROW. While the ROW and aboveground transmission line would result in visual impairment due to clearing and presence of the line, the necessary fire suppression would benefit visual quality in that it would eliminate visual impairment resulting from burn areas. The vegetation clearing and maintenance practices along the ROW also would serve a similar role to fire in reducing fuel loads.

Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on fire and fuels management in the respective BLM offices is discussed below.

BLM Rawlins Field Office (Agency Preferred Alternative)

The Alternative D route has been designated as suitable for the use of wildland fire as a resource benefit used to protect, maintain, and enhance vegetation resources and to allow fire to function in its natural ecological role. Effects to fire and fuels management would be the same as for Alternative A described above.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Areas crossed by Alternative D are classified as areas where wildland fire is desired but there are significant constraints. Effects to fire and fuels management would be the same as for Alternative A described above.

Alternative E

The Alternative E route would require plan amendments involving one BLM office—Vernal. The effect this plan amendment would have on fire and fuels management in the respective BLM office is discussed below.

BLM Vernal Field Office

Areas crossed by Alternative E are classified as areas where fire is not desired at all. Effects to fire and fuels management would be the same as for Alternative A described above. Effects to fire and fuels management would be the same as for Alternative A described above.

Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on the fire and fuels management in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

Areas crossed by Alternative F are classified as areas where wildland fire is desired but there are significant constraints. Effects to fire and fuels management would be the same as for Alternative A described above.

BLM Salt Lake Field Office (Agency Preferred Alternative)

Overall, wildlife fire within the FO is suppressed when it occurs on public land. Therefore, Alternative F may not constitute an area where additional suppression efforts would be required.

Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation that would require a plan amendment would be located in an area of existing fire suppression. Therefore, the Emma Park Alternative Variation may not constitute an area where additional suppression efforts would be required.

Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on fire and fuels management in the respective FOs is discussed below.

BLM Rawlins Field Office

The Baggs, Fivemile Point North, Fivemile Point South, and Mexican Flats alternative connectors have been designated as suitable for the use of wildland fire as a resource benefit used to protect, maintain, and enhance vegetation resources and to allow fire to function in its natural ecological role. Effects to fire and fuels management would be the same as for Alternative A described above.

BLM Las Vegas Field Office

A one-time exception to allow the Sunrise Mountain Alternative Connector route would have similar effects to management of cultural resources as described for Alternative A above.

4.5.6 Special Status Plant Species

The expansion or designation of new utility corridors would concentrate future utility development in these areas. Impacts to special status plant species would generally be the same as discussed in Section 4.5.5, Vegetation. On BLM- and USFS-managed lands (and private lands in many cases), surveys typically are required in potential or known habitats of threatened, endangered, or otherwise special status species. These surveys would help determine the presence of any special status species or extent of habitat, and protective measures generally would be taken to avoid or minimize direct disturbance in these important areas before any potential future proposed utility projects are permitted. Additional information on special status species that may be affected is presented in Section 3.6, Special Status Plant Species.

4.5.6.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on special status plant species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to special status species from expansion of the existing utility corridor along I-80 and designation of a new utility corridor south of I-80 would be the same as those stated above. **Table 4-2** presents the federally listed and candidate plant species for the BLM Rawlins FO.

Table 4-2 Federally Listed and Candidate Plant Species Potentially Occurring in the BLM Rawlins Field Office

Species	Scientific Name	County	State	Federal Status
Ute ladies'-tresses	*Spiranthes diluvialis*	Carbon, Sweetwater	Wyoming	Threatened

The proposed utility corridor would cross 86 acres of known or modeled areas with Ute ladies'-tresses. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Little Snake Field Office

Impacts to special status plant species from a new utility corridor would be the same as those stated above. **Table 4-3** presents the federally listed and candidate plant species for the BLM Little Snake FO.

Table 4-3 Federally Listed and Candidate Plant Species Potentially Occurring in the BLM Little Snake Field Office

Species	Scientific Name	County	State	Federal Status
Ute ladies'-tresses	*Spiranthes diluvialis*	Moffat	Colorado	Threatened

The proposed utility corridor would traverse 349 acres containing known or modeled areas with Ute ladies'-tresses. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Vernal Field Office

Impacts to special status plant species from a new utility corridor would be the same as those stated above. **Table 4-4** presents the federally listed and candidate species for the BLM Vernal FO.

Table 4-4 Federally Listed and Candidate Plant Species Potentially Occurring in the BLM Vernal Field Office

Species	Scientific Name	County	State	Federal Status
Graham penstemon	*Penstemon grameii*	Duchesne, Uintah	Utah	Proposed Threatened
Shrubby reed-mustard	*Schoenocrambe suffrutescens*	Duchesne, Uintah	Utah	Endangered
White River beardtongue	*Penstemon scariosus*	Uintah	Utah	Candidate
Ute ladies'-tresses	*Spiranthes diluvialis*	Duchesne, Uintah, Daggett	Utah	Threatened
Clay reed-mustard	*Schoenocrambe argillacea*	Uintah	Utah	Threatened
Pariette cactus	*Sclerocactus brevispinus*	Duchesne, Uintah	Utah	Threatened
Uinta Basin hookless cactus	*Sclerocactus wetlandicus*	Duchesne, Uintah	Utah	Threatened

The proposed utility corridor would cross areas containing known or modeled areas with 342 acres of Graham penstemon. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Las Vegas Field Office (Agency Preferred Alternative)

Impacts to special status plant species from a one-time exception through the Sunrise Mountain ISA would be the same as those stated above. **Table 4-5** presents the federally listed and candidate plant species for the BLM Las Vegas FO.

Table 4-5 Federally Listed and Candidate Plant Species Potentially Occurring in the BLM Las Vegas Field Office

Species	Scientific Name	County	State	Federal Status
Las Vegas buckwheat	*Eriogonum corymbosum var. nilesii*	Clark, Lincoln	Nevada	Candidate

The proposed utility corridor would cross 20 acres of areas containing known or modeled areas with Las Vegas buckwheat. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

4.5.6.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on special status species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

The proposed utility corridor would cross 214 acres of areas containing known or modeled Ute ladies'-tresses. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Little Snake Field Office

Impacts to special status plant species from a new utility corridor would be similar to those stated for Alternative A. A total of 295 acres of known or modeled areas for Ute ladies-tresses would be within the amended area. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM White River Field Office

Impacts to special status species from expansion and conversion of an underground utility corridor to allow aboveground development would be the same as those stated above. **Table 4-6** presents the federally listed and candidate plant species for the BLM White River FO.

Table 4-6 Federally Listed and Candidate Plant Species Potentially Occurring in the BLM White River Field Office

Species	Scientific Name	County	State	Federal Status
White River beardtongue	*Penstemon scariosus var. albifluvis*	Rio Blanco	Colorado	Candidate
Grahams penstemon	*Penstemon grahamii*	Rio Blanco	Colorado	Proposed Threatened
Ute ladies'-tresses	*Spiranthes diluvialis*	Rio Blanco	Colorado	Threatened

The proposed corridor would traverse areas containing known or modeled areas with Grahams penstemon, Ute ladies'-tresses, and White River beardtongue as follows: Grahams penstemon – 1,710 acres, Ute ladies'-tresses – 108 acres, and White River beardtongue – 1,247 acres. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Vernal Field Office

The proposed utility corridor would cross two acres with known or modeled areas of Ute ladies'-tresses and 1,148 acres with known or modeled areas of White River beardtongue. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Price Field Office

Impacts to special status plant species from a new utility corridor or possibly widening an existing corridor would be the same as those stated above. **Table 4-7** presents the federally listed and candidate plant species for the BLM Price FO.

Table 4-7 Federally Listed and Candidate Plant Species Potentially Occurring in the BLM Price Field Office

Species	Scientific Name	County	State	Federal Status
Jones Cycladenia	*Cycladenia humilis var. jonesii*	Grand, Emery	Utah	Threatened
Wright fishhook cactus	*Sclerocactus wrightiae*	Emery	Utah	Endangered
Last chance townsendia	*Townsendia aprica*	Emery	Utah	Threatened
San Rafael cactus	*Pediocactus despainii*	Emery	Utah	Endangered
Winkler cactus	*Pediocactus winkleri*	Emery	Utah	Threatened
Barneby reed-mustard	*Schoenocrambe barnebyi*	Emery	Utah	Endangered

The proposed utility corridor would cross 11,751 acres containing known or modeled areas with Wright fishhook cactus and 3,255 acres of known or modeled areas with Winkler cactus. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

4.5.6.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The effect these plan amendments would have on special status species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

The proposed utility corridor would cross 403 acres of areas containing known or modeled Ute ladies'-tresses. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM White River Field Office

Impacts to special status plant species from expansion and conversion of an underground utility corridor to allow aboveground development would be the same as those stated above for Alternative B.

BLM Vernal Field Office

Impacts to special status plant species from designating the new utility corridor would be the same as those stated above for Alternative B.

BLM Price Field Office

The proposed utility corridor would cross areas containing known or modeled areas with Jones cycladenia, San Rafael cactus, Wright fishhook cactus, and Winkler cactus as follows: Jones cycladenia – 773 acres; San Rafael cactus – 206 acres; Wright fishhook cactus – 7,944 acres; Winkler cactus – 523 acres. Overhead utilities could be mitigated to avoid or span identified habitats to the extent practical.

BLM Caliente Field Office

Impacts to special status plant species from a one-time exception through the Sunrise Mountain ISA would be the same as those stated above. **Table 4-8** presents the federally listed and candidate plant species for the BLM Caliente FO.

Table 4-8 Federally Listed and Candidate Plant Species Potentially Occurring in the BLM Caliente Field Office

Species	Scientific Name	County	State	Federal Status
Las Vegas buckwheat	*Eriogonum corymbosum var. nilesii*	Clark, Lincoln	Nevada	Candidate

The proposed utility corridor would not cross areas containing known or modeled areas with special status plant species.

USFS Fishlake National Forest

Impacts to special status plant species from the expanded utility corridor would be the same as those stated above. **Table 4-9** presents the federally listed and candidate plant species for the USFS Fishlake National Forest.

Table 4-9 Federally Listed and Candidate Plant Species Potentially Occurring in the USFS Fishlake National Forest

Species	Scientific Name	County	State	Federal Status
Arizona willow	*Salix arizonica*	Sevier	Utah	Candidate
Bicknell milkvetch	*Astragalus consobrinus*	Sevier	Utah	Sensitive
Elsinore buckwheat	*Eriogonum ostlundii*	Sevier	Utah	Sensitive
Last Chance townsendia	*Townsendia aprica*	Sevier	Utah	Threatened
Maguire campion	*Silene petersonii*	Sevier	Utah	Sensitive
Sigurd townsendia	*Townsendia jonesii var. lutea*	Sevier	Utah	Candidate
Ward beardtongue	*Penstemon wardii*	Sevier	Utah	Candidate
Wright fishhook cactus	*Sclerocactus wrightiae*	Sevier	Utah	Endangered

The proposed utility corridor would cross areas containing known or modeled areas as follows: Arizona willow – 4,320 acres, Bicknell milkvetch – 1,544 acres, Elsinore buckwheat – 2,303 acres, Last Chance townsendia – 2,247 acres, Maguire campion – 3,082 acres, Sigurd townsendia – 2,995 acres, Ward beardtongue – 7,368 acres, and Wright fishhook cactus – 307 acres. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

4.5.6.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on special status species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office (Agency Preferred Alternative)

The proposed utility corridor would cross 729 acres of areas containing known or modeled Ute ladies'-tresses. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

The proposed utility corridor would cross 2,619 acres of Grahams penstemon, 425 acres of Uinta Basin hookless cactus, and three acres of Ute ladies'-tresses. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

4.5.6.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on special status species in the respective area is discussed in the following section.

BLM Vernal Field Office

The proposed utility corridor would not cross areas containing known or modeled special status plant species.

4.5.6.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on special status plant species in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The proposed utility corridor would cross 3,937 acres of Grahams penstemon, 425 acres of Uinta Basin hookless cactus, and three acres of Ute ladies'-tresses. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical.

BLM Salt Lake Field Office (Agency Preferred Alternative)

Impacts to special status plant species from a new utility corridor on public lands would be the same as those stated above. **Table 4-10** presents the federally listed and candidate plant species for the BLM Salt Lake FO.

Table 4-10 Federally Listed and Candidate Species Potentially Occurring in the BLM Salt Lake Field Office

Species	Scientific Name	County	State	Federal Status
Deseret milk-vetch	*Astragalus desereticus*	Utah	Utah	Threatened
Clay phacelia	*Phacelia argillacea*	Utah	Utah	Endangered
Ute ladies'-tresses	*Spiranthes diluvialis*	Utah, Wasatch, Duchesne	Utah	Threatened

The proposed utility corridor would cross four acres of areas containing known or modeled areas Ute ladies'-tresses.

4.5.6.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation would not cross any known or modeled areas containing special status plant species.

4.5.6.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on special status plant species in the respective areas is discussed below.

BLM Rawlins Field Office

The proposed utility corridor would cross known or modeled areas for Ute ladies'-tresses for the Baggs (293 acres), Fivemile Point South (7 acres), and Mexican Flats (71 acres) alternative connectors. Overhead utilities could be mitigated to avoid or span identified habitat to the extent practical. The Fivemile Point North Alternative Connector would not cross any areas containing known or modeled special status plant species.

BLM Las Vegas Field Office

A one-time exception through the Sunrise Mountain ISA would cross 1 acre of Las Vegas buckwheat. Overhead utilities could be mitigated to span identified habitat to the extent practical.

4.5.7 Wildlife

Allowing for potential future development of utilities in areas where currently none exist could result in habitat loss, fragmentation, increased human disturbance, and direct wildlife mortalities. Potential impacts from habitat loss would include the incremental loss of potential cover and forage and the incremental increase of habitat fragmentation from vegetation removal associated with surface disturbance activities. Habitat loss or alteration also would result in direct losses of smaller, less mobile species of wildlife, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats. In areas where habitats are at, or near, carrying capacity, animal displacement could result in some unquantifiable reductions in local wildlife populations. Wildlife mortalities may occur as a result of road construction, vehicle and transmission line collisions, and crushing of less mobile species, nests, and/or burrows. Potential impacts also could include increased predation, nest and burrow abandonment, or loss of eggs or young during construction.

The primary impact is wildlife avoidance (displacement) of otherwise suitable habitat in and around the disturbance areas during construction and operation. Avoidance would result in displacement of animals from an area larger than the actual disturbance area. The primary operation-related impacts to wildlife are mortalities as a result of electrocution and collision from transmission line components. Additional information on wildlife is presented in Section 3.7, Wildlife.

4.5.7.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on wildlife in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to wildlife from 58 miles of a new utility corridor would be the same as those stated above. Impacts to big game (i.e., pronghorn and mule deer) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial winter range), and sensitivity to disturbance. The 58 miles of the newly designated utility corridor would overlap with critical habitat for elk (1,782 acres), mule deer (5,839 acres), and pronghorn antelope (8,112 acres). Sage grouse core areas would be overlapped by 6,019 acres and raptor nest buffer zones would be intersected for a total of 44,680 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife. Exceptions to stipulations for raptor nest buffers that occur within the corridor would be required for all utilities using the corridor. Mitigation and monitoring would be resolved for site-specific projects with the BLM staff.

BLM Little Snake Field Office

Impacts to wildlife from 42 miles of a new utility corridor to accommodate Alternative A would be the same as those stated above. Impacts to big game (i.e., pronghorn, mule deer, and elk) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., severe winter range), and sensitivity to disturbance. The 42 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (8,087 acres), mule deer (13,569 acres), and pronghorn antelope (8,352 acres). Sage grouse preliminary priority habitat would be overlapped by 49,110 acres and raptor nest buffer zones would be intersected for a total of 12,360 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife. Exceptions to stipulations for raptor nest buffers that occur within the corridor may be required for all utilities using the corridor. Mitigation techniques including relocation of active nests may be required.

BLM Vernal Field Office

Impacts to wildlife from 19 miles of a new utility corridor to accommodate Alternative A would be the same as those stated above. Impacts to big game (e.g., mule deer) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial winter range), and sensitivity to disturbance. The 19 miles of utility corridor that would require a plan amendment would overlap with critical habitat for mule deer (2,237 acres), and pronghorn antelope (10,667 acres). No sage grouse preliminary priority habitat or raptor nest buffer zones would be intersected. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

BLM Las Vegas Field Office (Agency Preferred Alternative)

Impacts to wildlife from a 1 mile, one-time exception through the Sunrise Mountain ISA would be the same as those stated above. Impacts to big game (i.e., desert bighorn sheep), raptors, and reptiles would be more pronounced within this FO due to presence of available habitat (e.g., occupied habitat) and sensitivity to disturbance. No known critical or priority habitat would be within the amended area.

4.5.7.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on wildlife in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to wildlife from 61 miles of a new utility corridor and locating aboveground development in portion of a corridor designated as underground only would be the same as those stated above. Impacts to big game (i.e., pronghorn and mule deer) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial winter range), and sensitivity to disturbance. The 61 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (1,782 acres), mule deer (5,958 acres), and pronghorn antelope (7,280 acres). Sage grouse core areas would be overlapped by 6,019 acres and eight raptor nest buffer zones would be intersected for a total of 44,713 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife. Exceptions to stipulations for raptor nest buffers that occur within the corridor would be required for all utilities using the corridor. Mitigation and monitoring would be resolved for site-specific projects with BLM staff.

BLM Little Snake Field Office

Impacts to wildlife from 37 miles of a new utility corridor to accommodate Alternative B would be similar to those stated for Alternative A. The 37 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (21,160 acres), mule deer (14,588 acres), and pronghorn antelope (11,502 acres). Sage grouse preliminary priority habitat would be overlapped by 59,681 acres and raptor nest buffer zones would be intersected for a total of 20,401 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

BLM White River Field Office

Impacts to wildlife expanding and locating aboveground development in 38 miles of a corridor designated as underground only would be the same as those stated above. Impacts to big game (i.e., pronghorn, mule deer, and elk) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., severe winter range), and sensitivity to disturbance. The 38 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (7,612 acres), mule deer (4,898 acres), and Rocky Mountain bighorn sheep (4 acres). Sage grouse preliminary priority habitat would be overlapped for a total of 11,459 acres and raptor nest buffer zones would be intersected for a total of 21,497 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife. Exceptions to stipulations for raptor nest buffers that occur within the corridor would be required for all utilities using the corridor. Mitigation and monitoring would be resolved for site-specific projects with BLM staff.

BLM Vernal Field Office

Impacts to wildlife from 6 miles of a new utility corridor to accommodate Alternative B would be the same as those stated above. Impacts to big game (e.g., mule deer) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial range), and sensitivity to disturbance. The 6 miles of utility corridor that would require a plan amendment would overlap with four acres of Rocky Mountain bighorn sheep. No sage grouse preliminary priority habitat or raptor nest buffers would be intersected. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

BLM Price Field Office

Impacts to wildlife from 14 miles of a new utility corridor would be the same as those stated above. Impacts to big game (i.e., desert bighorn sheep) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial winter range), and sensitivity to disturbance. The 14 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (1,581 acres) and pronghorn antelope (12,451 acres) and raptor nest buffer zones would be intersected for a total of 2,106 acres. No sage grouse preliminary priority habitat would be intersected. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

4.5.7.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The effect these plan amendments would have on wildlife and fish resources in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to wildlife from expanding 27 miles of an existing utility corridor would be the same as those stated above. Impacts to big game (i.e., pronghorn and mule deer) and raptors would be more

pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial winter range), and sensitivity to disturbance. The 27 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (100 acres), mule deer (15,869 acres), and pronghorn antelope (21,220 acres). Sage grouse core areas would be overlapped by 8,130 acres and raptor nest buffer zones would be intersected for a total of 34,896 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife. Exceptions to stipulations for raptor nest buffers that occur within the corridor would be required for all utilities using the corridor. Mitigation techniques and monitoring would be resolved for site-specific projects with BLM staff.

BLM White River Field Office

Impacts to wildlife from expanding and locating aboveground development in portion of a corridor designated as underground only would be the same as those stated above for Alternative B.

BLM Vernal Field Office

Impacts to wildlife from the new designated corridor would be the same as those stated above for Alternative B.

BLM Price Field Office

Impacts to wildlife from 10 miles of a new utility corridor would be similar to those stated above for Alternative B. The 10 miles of utility corridor would overlap with 60 acres of critical habitat for pronghorn and 3,017 acres of raptor nest buffer zones. No sage grouse preliminary priority habitat would be overlapped by the portion of the utility corridor that would require a plan amendment.

BLM Caliente Field Office

Impacts to wildlife from a 9-mile, one-time exception through the Kane Springs ACEC would be the same as those stated above. Impacts to big game (i.e., pronghorn and desert bighorn sheep), raptors, and reptiles would be more pronounced within this FO due to presence of available habitat, and sensitivity to disturbance. No critical big game habitat or raptor nest buffer zones would be intersected. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

USFS Fishlake National Forest

Impacts to wildlife from expanding 22 miles of the existing utility corridor would be the same as those stated above. Impacts to big game (i.e., mule deer and elk) and raptors would be more pronounced than other wildlife species in this national forest due to their relative abundance, presence of available habitat (e.g., crucial winter range), and sensitivity to disturbance. The 22 miles of utility corridor that would require a plan amendment would overlap with 18,032 acres of critical habitat for elk and 11,436 acres of critical habitat for mule deer. No sage grouse preliminary priority habitat or raptor nest buffer zones would be intersected. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

4.5.7.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on wildlife in the respective areas is discussed in the following sections.

BLM Rawlins Field Office (Agency Preferred Alternative)

Impacts to wildlife from expanding 76 miles of an existing utility and designating a new corridor would be the same as those stated above. Impacts to big game (i.e., pronghorn and mule deer) and raptors would

be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial winter range), and sensitivity to disturbance. The 76 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (1,779 acres), mule deer (16,252 acres), and pronghorn antelope (17,485 acres). Sage grouse core areas would be overlapped by 6,019 acres and raptor nest buffer zones would be intersected for a total of 57,211 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife. Exceptions to stipulations for raptor nest buffers that occur within the corridor would be required for all utilities using the corridor. Mitigation and monitoring would be resolved for site-specific projects with BLM staff.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Impacts to wildlife from 17 miles of a new utility corridor to accommodate Alternative D would be the same as those stated above. Impacts to big game (e.g., mule deer) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial range), and sensitivity to disturbance. The 17 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (323 acres), moose (1,811 acres), mule deer (113 acres), and pronghorn (64 acres). Sage grouse preliminary priority habitat would be overlapped by 1,077 acres. No raptor nest buffers would be intersected. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

4.5.7.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on wildlife in the respective area is discussed in the following section.

BLM Vernal Field Office

Impacts to wildlife from 6 miles of a new utility corridor to accommodate Alternative E would be the same as those stated above. Impacts to big game (e.g., mule deer) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial range), and sensitivity to disturbance. The 6 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (303 acres), moose (335 acres), mule deer (13 acres), and pronghorn (3,933 acres). Sage grouse preliminary priority habitat would be overlapped by 4,071 acres and raptor nest buffers would be overlapped by 1,573 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

4.5.7.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on special status plant species in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

Impacts to wildlife from 22 miles of a new utility corridor to accommodate Alternative F would be the same as those stated above. Impacts to big game (e.g., mule deer) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial range), and sensitivity to disturbance. The 22 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (251 acres), moose (2,706 acres), mule deer

(140 acres), and pronghorn (64 acres). Sage grouse preliminary priority habitat would be overlapped by 1,077 acres and raptor nest buffers would be overlapped by 845 acres. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

BLM Salt Lake Field Office (Agency Preferred Alternative)

Impacts to wildlife from 3 miles of a new utility corridor to accommodate Alternative F would be the same as those stated above. Impacts to big game (e.g., elk) and raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, presence of available habitat (e.g., crucial range), and sensitivity to disturbance. The 3 miles of utility corridor that would require a plan amendment would overlap with critical habitat for elk (180 acres) and moose (1,293 acres). Raptor nest buffers would be overlapped by 56 acres. No areas of sage grouse preliminary priority habitat would be overlapped. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

4.5.7.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation would overlap with critical habitat for elk (675 acres) and moose (2,488 acres). No areas of sage grouse preliminary priority habitat or raptor nest buffers would be overlapped. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

4.5.7.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on wildlife in the respective areas is discussed below.

BLM Rawlins Field Office

Designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile South (2 miles), and Mexican Flats (9 miles) alternative connectors would overlap with critical habitat for big game (i.e., pronghorn and mule deer) and raptors. The Baggs Alternative Connector would overlap with critical habitat for mule deer (19,430 acres) and pronghorn (15,891 acres) and 13,981 acres of raptor nest buffers; no areas of sage grouse core areas would be overlapped. The Fivemile Point North Alternative Connector would overlap with critical habitat for mule deer (2,187 acres) and 2,186 acres of raptor nest buffers; no areas of sage grouse core areas would be overlapped. The Fivemile Point South Alternative Connector would overlap with critical habitat for mule deer (999 acres) and 274 acres of raptor nest buffers; no areas of sage grouse core areas would be overlapped. The Mexican Flats Alternative Connector would overlap with critical habitat for mule deer (290 acres) and pronghorn (2,061 acres) and 5,507 acres of raptor nest buffers; no areas of sage grouse core areas would be overlapped. Concentrating utilities in this area could result in temporary or permanent displacement of wildlife.

BLM Las Vegas Field Office

Impacts to wildlife from a one-time exception through the Sunrise Mountain ISA would be the same as those stated for Alternative A.

4.5.8 Special Status Wildlife Species

The expansion or designation of new utility corridors would concentrate future utility development in these areas. Impacts to special status wildlife species would generally be the same as discussed in Section 4.5.7, Wildlife. On BLM- and USFS-managed lands (and private lands in many cases), surveys typically are required in potential or known habitats of threatened, endangered, or otherwise special

status species. These surveys would help determine the presence of any special status species or extent of habitat, and protective measures generally would be taken to avoid or minimize direct disturbance in these important areas before any potential future proposed utility projects are permitted. Additional information on special status species that may be affected is presented in Section 3.8, Special Status Wildlife Species.

4.5.8.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on special status wildlife species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to special status wildlife species from the 58 miles of expansion of the existing utility corridor along I-80 and designation of a new utility corridor south of I-80 would be the same as those stated above. **Table 4-11** presents the federally listed and candidate wildlife species for the BLM Rawlins FO.

Table 4-11 Federally Listed and Candidate Wildlife Species Potentially Occurring in the BLM Rawlins Field Office

Species	Scientific Name	County	State	Federal Status
Black-footed ferret	*Mustela nigripes*	Carbon	Wyoming	Experimental, NEP[1]
Black-footed ferret	*Mustela nigripes*	Carbon, Sweetwater	Wyoming	Endangered
Canada lynx	*Lynx canadensis*	Carbon	Wyoming	Threatened
Greater sage-grouse	*Centrocercus urophasianus*	Carbon, Sweetwater	Wyoming	Candidate
Interior Least Tern	*Sterna antillarum*	Carbon	Wyoming	Endangered
Piping Plover	*Charadrius melodus*	Carbon	Wyoming	Threatened
Whooping Crane	*Grus Americana*	Carbon	Wyoming	Endangered
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Carbon, Sweetwater	Wyoming	Candidate

[1] Non-essential Population.

Impacts to the black-footed ferret, greater sage-grouse, and raptors would be more pronounced than other species in this FO due to their relative abundance, available habitat, and sensitivity to disturbance. All proposed plan amendment alternatives through the BLM Rawlins FO cross USFWS non-block cleared areas and white-tailed prairie dog colonies, raptors nest buffers, and greater sage-grouse core areas along I-80. A total of 5,191 acres of white-tailed prairie dog colonies would be overlapped by the 58 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species. Projects proposed in the corridor would need to abide by timing stipulations and request an exception under unique or emergency situations.

BLM Little Snake Field Office

Impacts to special status wildlife species from 42 miles of a new utility corridor would be the same as those stated above. **Table 4-12** presents the federally listed and candidate wildlife species for the BLM Little Snake FO.

Table 4-12 Federally Listed and Candidate Wildlife Species Potentially Occurring in the BLM Little Snake Field Office

Species	Scientific Name	County	State	Federal Status
Black-footed ferret	*Mustela nigripes*	Moffat	Colorado	Experimental, NEP[1]
Canada lynx	*Lynx canadensis*	Moffat, Routt	Colorado	Threatened
North American wolverine	*Gulo gulo*	Moffat, Routt	Colorado	Candidate
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Moffat, Routt	Colorado	Candidate
Mexican spotted owl	*Strix occidentalis lucida*	Moffat	Colorado	Threatened

[1] Non-essential Population.

Impacts to greater sage-grouse and raptors would be more pronounced than other species in this BLM FO due to their relative abundance, available habitat, and sensitivity to disturbance. All proposed plan amendment alternatives through the BLM Little Snake Office cross raptors nest buffers and greater sage-grouse preliminary priority habitat. Exceptions to stipulations for buffers to protect these species that occur within the corridor would be necessary for all proposed utilities. A total of 3,633 acres of white-tailed prairie dog colonies would be overlapped by the 42 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species. Mitigation measures including avoidance or off-site compensatory mitigation and monitoring would be required site-specific projects.

BLM Vernal Field Office

Impacts to special status wildlife species from 19 miles of a new utility corridor would be the same as those stated above. **Table 4-13** presents the federally listed and candidate wildlife species for the BLM Vernal FO.

Table 4-13 Federally Listed and Candidate Wildlife Species Potentially Occurring in the BLM Vernal Field Office

Species	Scientific Name	County	State	Federal Status
Canada lynx	*Lynx canadensis*	Duchesne, Uintah, Daggett	Utah	Threatened
Black-footed ferret	*Mustela nigripes*	Uintah	Utah	Experimental, NEP[1]
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Duchesne, Uintah, Daggett	Utah	Candidate
Greater sage-grouse	*Centrocercus urophasianus*	Duchesne, Uintah, Daggett	Utah	Candidate
Mexican spotted owl	*Strix occidentalis lucida*	Duchesne, Uintah	Utah	Threatened

Impacts to the black-footed ferret, greater sage-grouse, and raptors would be more pronounced than other species in this BLM FO due to their relative abundance, available habitat, and sensitivity to disturbance. However, the area within the proposed utility corridor does not encroach on buffers for these species and is located north of occupied greater sage-grouse habitat. A total of 534 acres of white-tailed prairie dog colonies would be overlapped by the 19 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

BLM Las Vegas Field Office (Agency Preferred Alternative)

Impacts to special status wildlife species from a 1-mile, one-time exception through the Sunrise Mountain ISA would be the same as those stated above. **Table 4-14** presents the federally listed and candidate wildlife species for the BLM Las Vegas FO.

Table 4-14 Federally Listed and Candidate Wildlife Species Potentially Occurring in the BLM Las Vegas Field Office

Species	Scientific Name	County	State	Federal Status
Yuma clapper rail	*Rallus longirostris yumanensis*	Clark	Nevada	Endangered
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Clark	Nevada	Candidate
Southwestern willow flycatcher	*Empidonax traillii extimus*	Clark	Nevada	Endangered
Relict leopard frog	*Rana onca*	Clark	Nevada	Candidate
Desert tortoise	*Gopherus agassizii*	Clark	Nevada	Threatened

Impacts to reptiles (e.g., desert tortoise, banded gila monster) and raptors would be more pronounced within this FO due to available habitat, and sensitivity to disturbance. The area proposed for the one-time exception would affect 33 acres identified as potential habitat for the desert tortoise. Mitigation and monitoring measures would be required for site-specific projects.

4.5.8.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on special status wildlife species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to special status wildlife species from 61 miles of a new utility corridor or aboveground development in portion of a corridor designated as underground would be similar to those stated for Alternative A. A total of 5,793 acres of white-tailed prairie dog colonies would be overlapped by the 61 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

BLM Little Snake Field Office

Impacts to special status wildlife species from 37 miles of a new utility corridor would be similar to those stated for Alternative A. However, this alternative would affect more area of greater sage-grouse preliminary priority habitat. A total of 6,749 acres of white-tailed prairie dog colonies would be overlapped by the 37 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

BLM White River Field Office

Impacts to special status wildlife species from the expansion and conversion of 38 miles of an underground utility corridor to allow aboveground development would be the same as those stated above. **Table 4-15** presents the federally listed and candidate wildlife species for the BLM White River FO.

Table 4-15 Federally Listed and Candidate Wildlife Species Potentially Occurring in the BLM White River Field Office

Species	Scientific Name	County	State	Federal Status
Black-footed ferret	*Mustela nigripes*	Rio Blanco	Colorado	Experimental, NEP[1]
Canada lynx	*Lynx canadensis*	Rio Blanco	Colorado	Threatened
Greater sage-grouse	*Centrocercus urophasianus*	Rio Blanco	Colorado	Candidate
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Rio Blanco	Colorado	Candidate
North American wolverine	*Gulo gulo*	Rio Blanco	Colorado	Candidate
Mexican Spotted Owl	*Strix occidentalis lucida*	Rio Blanco	Colorado	Threatened

[1] Non-essential Population.

Impacts to greater sage-grouse and raptors would be more pronounced than other species in this BLM FO due to their relative abundance, available habitat, and sensitivity to disturbance. All proposed plan amendment alternatives through the BLM White River Field Office cross raptors nest buffers and greater sage-grouse preliminary general habitat. A total of 814 acres of white-tailed prairie dog colonies would be overlapped by the 38 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species. Mitigation and monitoring measures would be required with site-specific approvals.

BLM Vernal Field Office

Impacts to special status wildlife species from 6 miles of new utility corridor would be similar to those stated for Alternative A. However, this alternative would affect no areas of greater sage grouse preliminary priority habitat and no areas of white-tailed prairie dog.

BLM Price Field Office

Impacts to special status wildlife species from 14 miles of a new utility corridor or possibly widening an existing corridor would be the same as those stated above. **Table 4-16** presents the federally listed and candidate wildlife species for the BLM Price FO.

Table 4-16 Federally Listed and Candidate Wildlife Species Potentially Occurring in the BLM Price Field Office

Species	Scientific Name	County	State	Federal Status
California Condor	*Gymnogyps californianus*	Grand, Emery	Utah	Experimental, NEP[1]
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Grand, Emery	Utah	Candidate
Greater sage-grouse	*Centrocercus urophasianus*	Grand, Emery	Utah	Candidate
Mexican spotted owl	*Strix occidentalis lucida*	Grand, Emery	Utah	Threatened
Southwestern willow flycatcher	*Empidonax traillii extimus*	Grand, Emery	Utah	Endangered

[1] Non-essential Population.

Impacts to raptors would be more pronounced than other wildlife species in this BLM FO due to their relative abundance, available habitat, and sensitivity to disturbance. A total of 584 acres of white-tailed prairie dog colonies would be overlapped by the 14 miles of utility corridor that would require a plan

amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

4.5.8.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The effect these plan amendments would have on special status wildlife species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to special status wildlife species from 27 miles of a new utility corridor or aboveground development in portion of a corridor designated as underground would be similar to those stated for Alternative A. However, this alternative would also cross the greater sage-grouse core area that extends south of I-80 and would overlap a total of 1,112 acres of white-tailed prairie dog colonies by the 27 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

BLM White River Field Office

Impacts to special status wildlife species from a 38-mile expansion and conversion of an underground utility corridor to allow aboveground development would be the same as those stated above for Alternative B.

BLM Vernal Field Office

Impacts to special status wildlife species from 6 miles of new utility corridor would be the same as those stated above for Alternative B.

BLM Price Field Office

Impacts to special status wildlife species from 10 miles of a new utility corridor would be similar to those stated above for Alternative B. Exceptions to buffers of white-tailed prairie dog colonies may need to be granted if avoidance or minimization is not possible when siting utilities. A total of 584 acres of white-tailed prairie dog colonies would be overlapped by the 10 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

BLM Caliente Field Office

Impacts to special status wildlife species from a 9-mile, one-time exception through the Kane Springs ACEC would be the same as those stated above. **Table 4-17** presents the federally listed and candidate wildlife species for the BLM Caliente FO.

Table 4-17 Federally Listed and Candidate Wildlife Species Potentially Occurring in the BLM Caliente Field Office

Species	Scientific Name	County	State	Federal Status
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Lincoln	Nevada	Candidate
Southwestern willow flycatcher	*Empidonax traillii extimus*	Lincoln	Nevada	Endangered
Desert tortoise	*Gopherus agassizii*	Lincoln	Nevada	Threatened

Impacts to reptiles (e.g., desert tortoise, banded gila monster) and raptors would be more pronounced within this FO due to available habitat, and sensitivity to disturbance. This proposed plan amendment alternative would cross 276 acres of critical habitat and 3 acres of potential habitat for desert tortoise.

USFS Fishlake National Forest

Impacts to special status wildlife species from 22 miles of a new utility corridor would be the same as those stated above. Impacts to the Utah prairie dog, greater sage-grouse, and raptors would be more pronounced than other species in this national forest due to their relative abundance, available habitat, and sensitivity to disturbance. The proposed plan amendment alternative through the USFS Fishlake National Forest crosses occupied habitat for greater sage-grouse. No special status species critical habitat is overlapped by the 22 miles of utility corridor that would require a plan amendment. Mitigation measures including off-site mitigation may be needed as site-specific projects are proposed.

4.5.8.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on special status wildlife species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office (Agency Preferred Alternative)

Impacts to special status wildlife species from 76 miles of a new utility corridor or aboveground development in portion of a corridor designated as underground would be similar to those stated for Alternative A. A total of 3,343 acres of white-tailed prairie dog colonies would be overlapped by the 76 miles of utility corridor that would require a plan amendment. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Impacts to special status wildlife species from 17 miles of new utility corridor would be similar to those stated for Alternative A. However, this alternative would affect less area of greater sage grouse preliminary priority habitat and no areas of white-tailed prairie dog. Concentrating utilities in this area could result in temporary or permanent displacement of special status species.

4.5.8.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on special status wildlife species in the respective area is discussed in the following section.

BLM Vernal Field Office

Impacts to special status wildlife species from 22 miles of new utility corridor would be similar to those stated for Alternative A. This alternative would affect a comparable area of greater sage grouse preliminary priority habitat and 308 areas of white-tailed prairie dog. Concentrating utilities in this area could result in temporary or permanent displacement of special status species.

4.5.8.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendments would have on special status plant species in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

Impacts to wildlife from 22 miles of a new utility corridor to accommodate Alternative F would be similar to those stated for Alternative A. This alternative would affect less area of greater sage grouse preliminary priority habitat and no areas of white-tailed prairie dog. Concentrating utilities in this area could result in temporary or permanent displacement of special status species.

BLM Salt Lake Field Office (Agency Preferred Alternative)

Impacts to special status wildlife species from a new utility corridor on public lands would be the same as those stated above. **Table 4-18** presents the federally listed and candidate species for the BLM Salt Lake FO.

Table 4-18 Federally Listed and Candidate Species Potentially Occurring in the BLM Salt Lake Field Office

Species	Scientific Name	County	State	Federal Status
Canada lynx	*Lynx canadensis*	Utah, Wasatch, Duchesne	Utah	Threatened
Yellow-billed cuckoo (Western)	*Coccyzus americanus*	Utah, Wasatch, Duchesne	Utah	Candidate
Greater sage-grouse	*Centrocercus urophasianus*	Utah, Wasatch, Duchesne	Utah	Candidate

The area within the proposed 3-mile utility corridor would not encroach on buffers to protect special status species.

4.5.8.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3-mile utility corridor for the Emma Park Alternative Variation would not encroach on buffers to protect special status species.

4.5.8.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on special status wildlife species in the respective areas is discussed below.

BLM Rawlins Field Office

Designation of new utility corridors for the Baggs (18 miles) and Mexican Flats (9 miles) alternative connectors would overlap with white-tailed prairie dog habitat (61 and 3,112 acres, respectively), and no areas of greater sage grouse core areas. The Fivemile Point North (2 miles) and Fivemile South (2 miles) alternative connectors would not encroach on buffers to protect special status species.

BLM Las Vegas Field Office

Impacts to special status wildlife species from a one-time exception through the Sunrise Mountain ISA would overlap 30 acres of desert tortoise potential habitat. Concentrating utilities in this area could result in temporary or permanent displacement of this species.

4.5.9 Aquatic Biological Resources

Allowing for potential future development of utilities in areas where currently none exist could result in habitat loss or loss of individuals from equipment and vehicles. Habitat also could be affected by changes in water quality from increased sedimentation and potential fuel spills or use of surface water for construction. Additional information on aquatic biological resources is presented in Section 3.9, Aquatic Biological Resources.

4.5.9.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. Impacts to aquatic biological resources from potential utility crossings or effects to water quality resulting from construction would be the same as stated above. Additional impacts are noted below.

BLM Little Snake Field Office

Impacts to aquatic biological resources from 42 miles of a new utility corridor would be the same as those stated above. This alternative would cross both the Little Snake and Yampa rivers, which could deteriorate aquatic habitat conditions if utilities are concentrated in these areas.

4.5.9.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. Impacts to aquatic biological resources from potential utility crossings or effects to water quality resulting from construction would be the same as stated above. Additional impacts are noted below.

BLM Little Snake Field Office

Impacts to wildlife and fish resources from 37 miles of a new utility corridor would be similar to those stated for Alternative A.

BLM White River Field Office

Impacts to aquatic biological resources from 38 miles of a new utility corridor would be the same as those stated above. This alternative would have multiple stream crossings.

BLM Price Field Office

Impacts to aquatic biological resources from 14 miles of a new utility corridor would be the same as those stated above. This alternative would have a stream crossing.

4.5.9.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. Impacts to aquatic biological resources

from potential utility crossings or effects to water quality resulting from construction would be the same as stated above. Additional impacts are noted below.

BLM Rawlins Field Office

Impacts to aquatic biological resources from 27 miles of a new utility corridor would be the same as those stated above. This alternative would cross Muddy Creek.

BLM White River Field Office

Impacts would be the same as those stated above for Alternative B.

4.5.9.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. Impacts to aquatic biological resources from potential utility crossings or effects to water quality resulting from construction would be the same as stated above. Additional impacts are noted below.

BLM Rawlins Field Office (Agency Preferred Alternative)

Impacts to aquatic biological resources from 76 miles of a new utility corridor would be the same as those stated above. This alternative would have a stream crossing, which could deteriorate aquatic habitat conditions if utilities were concentrated in this area.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Impacts to aquatic biological resources from 17 miles of a new utility corridor to accommodate Alternative D would be the same as those stated above. This alternative would cross the Argyle Creek, which could deteriorate aquatic habitat conditions if utilities were concentrated in this area.

4.5.9.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. Impacts to aquatic biological resources from potential utility crossings or effects to water quality resulting from construction would be the same as for Alternative A.

4.5.9.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. Impacts to aquatic biological resources from potential utility crossings or effects to water quality resulting from construction would be the same as stated above. Additional impacts area noted below.

BLM Vernal Field Office (Agency Preferred Alternative)

Impacts to aquatic biological resources from 22 miles of a new utility corridor to accommodate Alternative F would be the same as those stated above. This alternative would cross the Argyle Creek, which could deteriorate aquatic habitat conditions if utilities were concentrated in this area.

4.5.9.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. Impacts to aquatic biological resources associated with the 3-mile utility corridor for the Emma Park Alternative Variation from potential utility crossings or effects to water quality resulting from construction would be the same as stated above.

4.5.9.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. Impacts to aquatic biological resources from potential utility crossings or effects to water quality resulting from construction would be the same as stated above. Additional impacts are noted below.

BLM Rawlins Field Office

Impacts to aquatic biological resources from a new utility corridor would be the same as those stated above. The Fivemile Point North and Baggs alternative connectors would have a stream crossing at Muddy Creek, which could deteriorate aquatic habitat conditions if utilities were concentrated in this area.

4.5.10 Special Status Aquatic Species

The expansion or designation of new utility corridors would concentrate future utility development in these areas. Impacts to special status aquatic species would generally be the same as discussed in Section 4.5.9, Aquatic Biological Resources. On BLM- and USFS-managed lands (and private lands in many cases), surveys typically are required in potential or known habitats of threatened, endangered, or otherwise special status species. These surveys would help determine the presence of any special status species or extent of habitat, and protective measures generally would be taken to avoid or minimize direct disturbance in these important areas before any potential future proposed utility projects are permitted. Section 3.10, Special Status Aquatic Species, provides a detailed description of impacts to special status aquatic species within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.10.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on special status aquatic species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to special status aquatic species from the 58-mile expansion of the existing utility corridor along I-80 and designation of a new utility corridor south of I-80 would be the same as those stated above. **Table 4-19** presents the federally listed and candidate aquatic species for the BLM Rawlins FO.

Table 4-19 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Rawlins Field Office

Species	Scientific Name	County	State	Federal Status
Pallid Sturgeon	*Scaphirhynchus albus*	Carbon	Wyoming	Endangered
Bonytail	*Gila elegans*	Carbon, Sweetwater	Wyoming	Endangered
Colorado Pikeminnow	*Ptychocheilus lucius*	Carbon, Sweetwater	Wyoming	Endangered

Table 4-19 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Rawlins Field Office

Species	Scientific Name	County	State	Federal Status
Humpback Chub	*Gila cypha*	Carbon, Sweetwater	Wyoming	Endangered
Razorback Sucker	*Xyrauchen texanus*	Carbon, Sweetwater	Wyoming	Endangered

The proposed utility corridor would cross one stream near the Colorado state line, which is occupied by Colorado pikeminnow habitat. Overhead utilities could be mitigated to avoid or span occupied habitat; however, buried utilities would be unable to avoid the occupied stream.

BLM Little Snake Field Office

Impacts to special status aquatic species from 42 miles of a new utility corridor would be the same as those stated above. **Table 4-20** presents the federally listed and candidate aquatic species for the BLM Little Snake FO.

Table 4-20 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Little Snake Field Office

Species	Scientific Name	County	State	Federal Status
Humpback chub	*Gila cypha*	Moffat	Colorado	Endangered
Colorado pikeminnow	*Ptychocheilus lucius*	Moffat	Colorado	Endangered
Bonytail	*Gila elegans*	Moffat	Colorado	Endangered
Razorback sucker	*Xyrauchen texanus*	Moffat	Colorado	Endangered

The proposed utility corridor would have two stream crossings, one occupied by Colorado Pikeminnow and one by both the Colorado pikeminnow and razorback sucker. Overhead utilities could be mitigated to avoid or span occupied habitat; however, buried utilities would be unable to avoid the occupied stream.

BLM Vernal Field Office

Impacts to special status aquatic species from 19 miles of a new utility corridor would be the same as those stated above. **Table 4-21** presents the federally listed and candidate aquatic species for the BLM Vernal FO.

Table 4-21 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Vernal Field Office

Species	Scientific Name	County	State	Federal Status
Humpback chub	*Gila cypha*	Duchesne, Uintah, Daggett	Utah	Endangered
Colorado pikeminnow	*Ptychocheilus lucius*	Duchesne, Uintah, Daggett	Utah	Endangered
Bonytail	*Gila elegans*	Duchesne, Uintah, Daggett	Utah	Endangered
Razorback sucker	*Xyrauchen texanus*	Duchesne, Uintah, Daggett	Utah	Endangered

The proposed utility corridor would not cross streams occupied by special status aquatic species.

BLM Las Vegas Field Office (Agency Preferred Alternative)

Impacts to special status aquatic species from a 1-mile, one-time exception through the Sunrise Mountain ISA would be the same as those stated above. **Table 4-22** presents the federally listed and candidate aquatic species for the BLM Las Vegas FO.

Table 4-22 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Las Vegas Field Office

Species	Scientific Name	County	State	Federal Status
Moapa dace	*Moapa coriacea*	Clark	Nevada	Endangered
Pahrump poolfish	*Empetrichthys latos*	Clark	Nevada	Endangered
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*	Clark	Nevada	Threatened
Woundfin	*Plagopterus argentissimus*	Clark	Nevada	Endangered
Bonytail	*Gila elegans*	Clark	Nevada	Endangered
Virgin River chub	*Gila robusta seminuda*	Clark	Nevada	Endangered
Razorback sucker	*Xyrauchen texanus*	Clark	Nevada	Endangered

The proposed one-time exception would not cross streams occupied by special status aquatic species.

4.5.10.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on special status aquatic species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to special status aquatic species from 58 miles of a new utility corridor or aboveground development in portion of a corridor designated as underground would be the same as those stated for Alternative A. The proposed utility corridor would cross one stream near the Colorado state line, which is occupied by the Colorado pikeminnow. Overhead utilities could be mitigated to avoid or span occupied habitat; however, buried utilities would be unable to avoid the occupied stream.

BLM Little Snake Field Office

Impacts to special status aquatic species from 37 miles of a new utility corridor would be the same as those stated for Alternative A. The proposed utility corridor would have two stream crossings; however, no special status aquatic species occur within these streams.

BLM White River Field Office

Impacts to special status aquatic species from expansion and conversion of 38 miles of an underground utility corridor to allow aboveground development would be the same as those stated above. **Table 4-23** presents the federally listed and candidate aquatic species for the BLM White River FO.

Table 4-23 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM White River Field Office

Species	Scientific Name	County	State	Federal Status
Humpback chub	*Gila cypha*	Rio Blanco	Colorado	Endangered
Colorado pikeminnow	*Ptychocheilus lucius*	Rio Blanco	Colorado	Endangered
Bonytail	*Gila elegans*	Rio Blanco	Colorado	Endangered
Razorback sucker	*Xyrauchen texanus*	Rio Blanco	Colorado	Endangered

The proposed utility corridor would not cross streams occupied by special status aquatic species.

BLM Vernal Field Office

Impacts to special status species from 6 miles of new utility corridor would not affect any areas occupied by special status aquatic species.

BLM Price Field Office

Impacts to special status aquatic species from 14 miles of a new utility corridor or possibly widening an existing corridor would be the same as those stated above. **Table 4-24** presents the federally listed and candidate aquatic species for the BLM Price FO.

Table 4-24 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Price Field Office

Species	Scientific Name	County	State	Federal Status
Humpback chub	*Gila cypha*	Grand, Emery	Utah	Endangered
Colorado pikeminnow	*Ptychocheilus lucius*	Grand, Emery	Utah	Endangered
Bonytail	*Gila elegans*	Grand, Emery	Utah	Endangered
Razorback sucker	*Xyrauchen texanus*	Grand, Emery	Utah	Endangered

The proposed utility corridor would not cross streams occupied by special status aquatic species.

4.5.10.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The effect these plan amendments would have on special status aquatic species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Impacts to special status aquatic species from 27 miles of a new utility corridor or aboveground development in portion of a corridor designated as underground would be the same as those stated for Alternative A. The proposed utility corridor would cross one stream; however, it does not contain any special status aquatic species.

BLM White River Field Office

Impacts to special status aquatic species from expansion and conversion of 38 miles of an underground utility corridor to allow aboveground development would be the same as those stated above for Alternative B.

BLM Vernal Field Office

Similar to Alternative B, impacts to special status species from 6 miles of new utility corridor would not affect any areas occupied by special status aquatic species.

BLM Price Field Office

Impacts to special status aquatic species from 10 miles of a new utility corridor would not cross streams occupied by special status aquatic species.

BLM Caliente Field Office

Impacts to special status aquatic species from 9 miles of a one-time exception through the Kane Springs ACEC would be the same as those stated above. **Table 4-25** presents the federally listed and candidate aquatic species for the BLM Caliente FO.

Table 4-25 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Caliente Field Office

Species	Scientific Name	County	State	Federal Status
Pahranagat roundtail chub	*Gila robusta jordani*	Lincoln	Nevada	Endangered
Big Spring spinedace	*Lepidomeda mollispinis pratensis*	Lincoln	Nevada	Threatened
Hiko White River springfish	*Crenichthys baileyi grandis*	Lincoln	Nevada	Endangered
White River springfish	*Crenichthys baileyi baileyi*	Lincoln	Nevada	Endangered

The proposed utility corridor would not cross streams occupied by special status aquatic species.

USFS Fishlake National Forest

The 23-mile proposed utility corridor would not cross streams occupied by special status aquatic species.

4.5.10.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on special status aquatic species in the respective areas is discussed in the following sections.

BLM Rawlins Field Office (Agency Preferred Alternative)

Impacts to special status aquatic species from 76 miles of a new utility corridor or aboveground development in portion of a corridor designated as underground would be the same as those stated for Alternative A. The proposed utility corridor would cross one stream; however, it does not contain any special status aquatic species.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Impacts to special status species from 17 miles of new utility corridor would not affect any areas occupied by special status aquatic species.

4.5.10.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on special status aquatic species in the respective area is discussed in the following section.

BLM Vernal Field Office

Impacts to special status species from 6 miles of new utility corridor would not affect any areas occupied by special status aquatic species.

4.5.10.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. Impacts to special status aquatic species from potential utility crossings or effects to water quality resulting from construction would be the same as stated above. Additional impacts area noted below.

BLM Vernal Field Office (Agency Preferred Alternative)

Impacts to special status aquatic species from 22 miles of a new utility corridor to accommodate Alternative F would not affect any areas occupied by special status aquatic species.

BLM Salt Lake Field Office (Agency Preferred Alternative)

Impacts to special status aquatic species from a new utility corridor on public lands would be the same as those stated above. **Table 4-26** presents the federally listed and candidate aquatic species for the BLM Salt Lake FO.

Table 4-26 Federally Listed and Candidate Aquatic Species Potentially Occurring in the BLM Salt Lake Field Office

Species	Scientific Name	County	State	Federal Status
Humpback chub	*Gila cypha*	Utah, Wasatch, Duchesne	Utah	Endangered
Colorado pikeminnow	*Ptychocheilus lucius*	Utah, Wasatch, Duchesne	Utah	Endangered
Bonytail	*Gila elegans*	Utah, Wasatch, Duchesne	Utah	Endangered
Least chub	*Iotichthys phlegethontis*	Utah	Utah	Candidate
Razorback sucker	*Xyrauchen texanus*	Utah, Wasatch, Duchesne	Utah	Endangered
June sucker	*Chasmistes liorus*	Utah	Utah	Endangered

The proposed utility corridor would not cross streams occupied by special status aquatic species.

4.5.10.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. Impacts to special status aquatic species associated with the 3-mile utility corridor for the Emma Park Alternative Variation would not affect any areas occupied by special status aquatic species.

4.5.10.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on special status aquatic species in the respective areas is discussed below.

BLM Rawlins Field Office

The Baggs (18 miles), Fivemile Point North (2 miles), Fivemile Point south (2 miles), and Mexican Flats (9 miles) alternative connectors would not affect any areas occupied by special status aquatic species.

BLM Las Vegas Field Office

Impacts to special status aquatic species from a 1-mile, one-time exception through the Sunrise Mountain ISA would not affect any areas occupied by special status aquatic species.

4.5.11 Cultural Resources and Native American Concerns

Plan amendments to create new or expand existing utility corridors would influence the ability to locate utilities in areas. These actions in turn have direct impacts on cultural resources, which are analyzed pursuant to NEPA as individual projects are proposed. Cultural properties located in utility corridors would be subject to a potentially higher level of activities that disturb the ground, which would increase the likelihood of unanticipated surface and subsurface discoveries. In addition, utility corridors would be subject to a potentially higher level of visual intrusions from placement of structures and facilities, which would affect cultural resources where setting is an aspect of their integrity. However, all projects proposed in the utility corridors would require SHPO and tribal consultation as well as compliance with Section 106 and 110 of the NHPA. Section 3.11 provides a detailed description of impacts to resources within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.11.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The effect these plan amendments would have on the management of cultural resources in the respective FOs is discussed below.

BLM Rawlins Field Office

The newly designated 58-mile corridor would cross one segment of the Cherokee and Overland trails and the Rawlins to Baggs Road Trail and would be within the viewshed of these historic trails as well as the Lincoln Highway Trail. The Cherokee Trail in southwestern Wyoming has been erased and no visible remnants remain. A total of 1 mile of the Cherokee Trail, 2 miles of the Overland Trail, and 2 miles of the Rawlins to Baggs Road would be overlapped by the 58 miles of utility corridor that would require a plan amendment. Disturbance to cultural resource sites and visual impacts to historic properties may be reduced, but not eliminated, through implementation of design features and mitigation measures outlined in the project-specific programmatic agreements and treatment plans. Cultural resource goals and objectives in the RMP would be compromised for historic trails if contributing segments are crossed. It is unknown at this time whether segments of historic trails or roads crossed by the alternatives contribute to

the overall NRHP eligibility of these linear resources. A total of 589 known NHRP eligible sites would be overlapped by the amended area.

BLM Little Snake Field Office

The 42 miles of newly designated corridor would be located to the east of the following cultural resource areas that have been identified as high priority by the BLM: Sand Wash Basin, Vermillion Basin, Irish Canyon, and Cross Mountain. A total of 192 known NHRP eligible sites would be overlapped by the amended area. Effects would be the same a stated above.

BLM Vernal Field Office

The 19 miles of new utility corridor would overlap 41 known NHRP eligible sites. Effects would be the same as stated above.

BLM Las Vegas Field Office (Agency Preferred Alternative)

There are no known culturally sensitive or high priority areas within the new proposed utility corridor location.

4.5.11.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. The effect these plan amendments would have on the management of cultural resources in the respective FOs is discussed below.

BLM Rawlins Field Office

Sixty-one miles of a new utility corridor and above ground designation of an existing corridor would require a plan amendment. The southern portion of Alternative B would be located in a corridor designated as underground-only, which crosses one segment of the Cherokee and Overland trails and one segment of the Rawlins to Baggs Road Trail and would be within the viewshed of these historic trails as well as the Lincoln Highway Trail. A total of 1 mile of the Cherokee Trail, 1 mile of the Overland Trail, and 2 miles of the Rawlins to Baggs Road would be overlapped by the 61 miles of utility corridor that would require a plan amendment. While there are pipelines in the existing corridor, conversion to allow aboveground facilities would enable more effects to the viewshed of cultural resources and historic trails. A total of 498 known NHRP eligible sites would be overlapped by the amended area. Effects to the management of cultural resources would be the same as for Alternative A described above.

BLM Little Snake Field Office

The 37 miles of newly designated corridor would be located to the east of the following cultural resource areas that have been identified as high priority by the BLM: Sand Wash Basin, Vermillion Basin, Irish Canyon, and Cross Mountain. A total of 115 known NHRP eligible sites would be overlapped by the amended area. Effects to the management of cultural resources would be the same as for Alternative A described above.

BLM White River Field Office

Thirty-eight miles of a new utility corridor would require a plan amendment. The closest area of known cultural significance is the Canyon Pintado Historic District, which abuts the northern portion of the corridor. Additionally, the Texas-Missouri-Evacuation Creek area is known to contain cultural resources and would be partially overlapped by the expanded corridor. Both areas are categorized as ROW avoidance in the RMP and future utilities in the expanded corridor should be sited to avoid these areas. While there are pipelines in the existing corridor, conversion to allow aboveground facilities would enable

more effects to the viewshed of cultural resources and these areas of known cultural significance. A total of 835 known NHRP eligible sites would be overlapped by the amended area.

BLM Vernal Field Office

The 6 miles of new utility corridor would overlap with no known NHRP eligible sites.

BLM Price Field Office

Fourteen miles of a new utility corridor would require a plan amendment. Within this area, a total of 72 known NHRP eligible sites would be overlapped by the amended area.

4.5.11.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. The effect these plan amendments would have on the management of cultural resources in the respective BLM offices and national forest is discussed below.

BLM Rawlins Field Office

The existing designated corridor along Highway 789 crosses one segment of the Cherokee and Overland trails and two segments of the Rawlins to Baggs Road Trail and would be within the viewshed of these historic trails as well as the Lincoln Highway Trail. The 27 miles of expanded utility corridor would include more area crossed by the trail. Two miles of the Cherokee Trail, 1 mile of the Overland Trail, and 5 miles of the Rawlins to Baggs Road would be overlapped by the 27 miles of utility corridor that would require a plan amendment. A total of 272 known NHRP eligible sites would be overlapped by the amended area.

BLM Vernal Field Office

The 6 miles of new utility corridor would overlap with no known NHRP eligible sites.

BLM White River Field Office

Effects to the management of cultural resources as a result of converting to an aboveground corridor would be the same as for Alternative B described above.

BLM Price Field Office

Ten miles of a new utility corridor would require a plan amendment. Within this area, a total of 120 known NHRP eligible sites would be overlapped by the amended area. Effects would be the same as previously described.

BLM Caliente Field Office

Nine miles of a new utility corridor would require a plan amendment. Within this area, one known NHRP eligible site would be overlapped by the amended area. Effects would be the same as previously described.

USFS Fishlake National Forest

Expansion of the existing transportation and utility corridor is unlikely to interfere with the standards and guidelines for the management of cultural resources. While allowing for exceptions to High SIO in the area may introduce elements that contrast with the setting, no areas of cultural significance were identified in this area. However, 108 known NHRP eligible sites would be overlapped by the amended area.

4.5.11.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on the management of cultural resources in the respective BLM offices is discussed below.

BLM Rawlins Field Office (Agency Preferred Alternative)

The 76 miles of newly designated corridor would cross three segments of the Cherokee Trail, one segment of the Overland Trail, and one segment of the Rawlins to Baggs Road Trail and would be within the viewshed of these historic trails as well as the Lincoln Highway Trail. Effects to the management of cultural resources would be the similar to Alternative A described above, but would have potential to impact more of the Cherokee Trail. Eight miles of the Cherokee Trail, 2 miles of the Overland Trail, and 2 miles of the Rawlins to Baggs Road would be overlapped by the 76 miles of utility corridor that would require a plan amendment. A total of 741 known NHRP eligible sites would be overlapped by the amended area.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

The 17 miles of new utility corridor would overlap with 8 known NHRP eligible sites. Effects would be the same as previously described.

4.5.11.5 Alternative E

The Alternative E route would require plan amendments involving one BLM office—Vernal. The effect this plan amendment would have on the management of cultural resources in the respective BLM office is discussed below.

BLM Vernal Field Office

The 6 miles of new utility corridor would overlap with 26 known NHRP eligible sites. Effects would be the same as previously described.

4.5.11.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect these plan amendments would have on the management of cultural resources in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22 miles of new utility corridor would overlap with 8 known NHRP eligible sites. Effects would be the same as previously described.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3 miles of new utility corridor would overlap with 2 known NHRP eligible sites. Effects would be the same as previously described.

4.5.11.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3 miles of new utility corridor for the Emma Park Alternative Variation would overlap with no known NHRP eligible sites. Effects would be the same as previously described.

4.5.11.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on the management of cultural resources in the respective FOs is discussed below.

BLM Rawlins Field Office

Designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile South (2 miles), and Mexican Flats (9 miles) alternative connectors would overlap with areas of known NHRP eligible sites. The Baggs Alternative Connector would cross non-contributing segments and be within the viewshed of the Cherokee and Rawlins to Baggs Road Trails, and overlap with 274 known NHRP eligible sites. The Fivemile Point North Alternative Connector would overlap with no known NHRP eligible sites. The Fivemile Point South Alternative Connector would overlap with 12 known NHRP eligible sites. The Mexican Flats Alternative Connector would overlap with 233 known NHRP eligible sites. Effects would be the same as previously described.

BLM Las Vegas Field Office

A 1-mile, one-time exception to allow the Sunrise Mountain Alternative Connector route would overlap with no known NHRP eligible sites.

4.5.12 Visual Resources

Plan amendments to expand an existing corridor or designate a new utility corridor and alter VRM classes would not directly impact visual resources; however, authorization of these amendments would open areas that currently prevent utility development to allow potential future development of energy transmission and other linear ROW projects. Resulting effects to visual resources occur to federal and non-federal lands within and adjacent to areas that are within the viewshed.

Allowing for the potential future development of utilities in areas not previously developed could result in visible landscape altering activities and the permanent addition of overhead transmission structures in predominantly natural landscapes that provide settings for recreation and other uses. Indirect impacts to the scenic qualities of the natural landscapes would occur from visual contrast associated with landscape altering activities and visual intrusions that modify the form, line, color, and texture of the landscape character. Potential future contrasts would alter predominantly natural landscape settings to landscapes that could eventually trend toward an industrialized setting.

Potential future developments proposed in areas where developments do not exist must meet BLM and USFS objectives for visual resource management on federal lands. Since areas of VRM Class I/II on BLM lands and very high/high SIO or preservation/retention VQO are intended to maintain or improve the visual setting, any potential future large-scale or predominantly-located utility developments in these areas could not be reasonably mitigated to meet the visual resource objectives and plan amendments are proposed in these areas. Adequate visual mitigation in the form of standard BMPs from agency plans and guidance would allow some landscape altering activities and visual intrusions that minimize the extent of modification to the form, line, color, and texture of the landscape character and minimize visual contrast with the natural setting to be compatible with VRM Class III on BLM lands and areas of moderate SIO or Partial Retention VQO in national forests. While the objectives for any development that occurs in VRM

Class IV on BLM lands and areas of low/very low SIO or modification/maximum modification in national forests would allow for more landscape altering activities and visual contrast with the natural landscape, every attempt will be made to minimize the impact of potential future development activities through careful location, minimal disturbance, and repeating the basic elements to the extent practical and feasible.

Section 3.12, Visual Resources, provides a detailed description of visual resource impacts within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.12.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The effect these plan amendments would have on visual resources in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Expanding an existing utility corridor along I-80 and designating a new corridor south of I-80 for a combined total of 58 miles would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. Potential future projects proposed in the utility corridor would need to conform with the VRM Class III and IV objectives on public lands, including portions of the corridor that are located in sensitive viewpoints of the Continental Divide National Scenic Trail SRMA, the Rawlins to Baggs Road Historic Trail, and the Overland National Historic Trail. Siting utilities in multiple locations along I-80 and near Powder Rim in the corridor would not be able to meet visual quality objectives after mitigation; however, none of the amended areas would be located within VRM Class I or II areas. Visual resource mitigation measures discussed in Section 3.12 would minimize the extent of these impacts.

BLM Little Snake Field Office

A newly designated 43-mile utility corridor in the Little Snake FO to accommodate Alternative A would be located in an area not previously developed for utilities and would allow for additional potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. The new utility corridor would be located in an area that may include recreation and rural land uses that are sensitive to changes in landscape settings. Potential future projects proposed in the new utility corridor would need to conform to VRM Class III objectives on public lands. Part of the corridor is located in close proximity (up to an estimated 1.0 to 1.5 mile distance) to sensitive viewpoints. Depending on project location, these viewpoints could be affected by proposed future developments within the designated corridor. Affected sensitive viewpoints occur within the nearby Sand Wash Basin and the Cross Mountain WSA. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation. None of the amended areas would be located within VRM Class I or II areas. Visual resource mitigation measures discussed in Section 3.12 would minimize the extent of these impacts.

BLM Vernal Field Office

A 19-mile newly designated utility corridor in the Vernal FO to accommodate Alternative A would be located in an area that generally parallels an existing 345-kV transmission line and would allow for additional potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. Potential future projects proposed in the new utility corridor would need to conform to the VRM Class III and IV objectives on public lands. None of the amended areas would be located within VRM Class I or II areas.

BLM Las Vegas Field Office (Agency Preferred Alternative)

A plan amendment to allow a 1-mile, one-time exception through the Sunrise ISA/Rainbow Gardens ACEC/Sunrise Mountain SRMA that parallels existing high voltage transmission lines would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. The one-time exception would need to conform with VRM Class III objectives on public lands, including portions of the corridor that are located in sensitive viewpoints of the surrounding sensitive areas including the Sunrise Mountain ISA, Rainbow Gardens ACEC, and Sunrise Mountain SRMA. None of the amended areas would be located within VRM Class I or II areas.

4.5.12.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on visual resources in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Expanding the existing corridor along I-80 and converting an existing underground utility corridor for a combined total of 61 miles to allow overhead facilities south of I-80 would allow for additional potential future aboveground linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the utility corridor would need to conform with the VRM Class III and IV objectives on public lands, including portions of the corridor that are located in sensitive viewpoints of the Continental Divide National Scenic Trail SRMA, the Rawlins to Baggs Road Historic Trail, and the Overland National Historic Trail. Siting utilities in multiple locations along I-80 and near Powder Rim in the corridor would not be able to meet visual quality objectives after mitigation.

BLM Little Snake Field Office

A 37-mile newly designated utility corridor in the Little Snake FO would be located in an area not previously developed for utilities and would allow for additional potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the new utility corridor would need to conform to VRM Class III objectives on public lands. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

BLM White River Field Office

Thirty-eight miles of a new utility corridor would require a plan amendment. Alternative B crosses scenic BLM lands managed with VRM Class II objectives in the southwest corner of the FO and would not conform to the objectives for VRM Class II, which accommodates only low levels of change to the landscape to retain the existing natural landscape character and could not be reasonably mitigated to a level that would allow the large-scale aboveground utilities to meet VRM Class II objectives. A total of 1,244 acres of VRM Class I and 8,556 acres of VRM class II viewshed areas would be overlapped by the amended areas. Converting an existing underground utility corridor to allow overhead facilities in the White River FO would allow for additional potential future aboveground linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. Potential future projects proposed in the utility corridor would need to conform with the VRM Class objectives on public lands, including portions of the corridor that are located in

sensitive viewpoints of the Oil Spring Mountain WSA. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

BLM Vernal Field Office

A 6-mile newly designated utility corridor in the Vernal FO to accommodate Alternative B would be located in an area not previously developed for utilities and would allow for potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the new utility corridor would need to conform with VRM Class III objectives on public lands. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

BLM Price Field Office

A 14-mile newly designated utility corridor in the Price FO would be located in an area with no existing transmission lines and would allow for additional potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the new utility corridor would need to conform to the VRM Class III and IV objectives on public lands.

4.5.12.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The effect these plan amendments would have on visual resources in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

Expanding 27 miles of the existing corridors would allow for additional potential future aboveground linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the utility corridor would need to conform with the VRM Class III and IV objectives on public lands, including portions of the corridor that are located in sensitive viewpoints of the Continental Divide National Scenic Trail SRMA, the Rawlins to Baggs Road Historic Trail, and the Overland National Historic Trail. Siting utilities in multiple locations along I-80 and along Highway 789 in the corridor would not be able to meet visual quality objectives after mitigation.

BLM White River Field Office

Impacts would be the same as the impacts identified for Alternative B.

BLM Vernal Field Office

Impacts would be the same as the impacts identified for Alternative B.

BLM Price Field Office

A 10-mile newly designated utility corridor in the Price FO would be located in an area with no existing transmission lines and would allow for additional potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the new utility corridor would need to conform to the VRM Class III

and IV objectives on public lands. Siting utilities in the corridor would not be able to meet visual quality objectives after mitigation.

Caliente Field Office

A 9-mile, one-time exception to allow another utility through the Kane Springs ACEC would allow for additional potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. One acre of VRM Class I viewshed area would be overlapped by the amended area. Potential future projects proposed in the ROW avoidance area would need to conform with VRM Class III objectives on public lands, including portions of the corridor that are located in sensitive viewpoints of the surrounding sensitive areas including the Delamar Mountains Wilderness.

USFS Fishlake National Forest

Alternative C near I-70 and at the south end of the Canyon Mountains overlaps 5,303 acres managed with a High SIO, which requires the landscape character to appear intact but allows for deviations that must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident. A plan amendment to allow exceptions to the SIO within the expanded utility corridor would allow projects that alter the landscape character with noticeable deviations, but are visually subordinate to the landscape character being viewed.

4.5.12.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on visual resources in the respective areas is discussed in the following sections.

BLM Rawlins Field Office (Agency Preferred Alternative)

Expanding the existing corridor along I-80 and designating a new corridor south of I-80 for a combined total of 76 miles would allow for additional potential future aboveground linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the utility corridor would need to conform with the VRM Class III and IV objectives on public lands, including portions of the corridor that are located in sensitive viewpoints of the Continental Divide National Scenic Trail SRMA, the Rawlins to Baggs Road Historic Trail, and the Overland National Historic Trail. Siting utilities in multiple locations along I-80 and near Powder Rim in the corridor would not be able to meet visual quality objectives after mitigation.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

A 17-mile newly designated utility corridor in the Vernal FO to accommodate Alternative D would be located in an area not previously developed for utilities and would allow for potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. Alternative D crosses 54 acres managed with VRM Class II objectives, which accommodate only low levels of change to the landscape to retain the existing natural character and could not be reasonably mitigated to a level that would allow the large-scale aboveground utilities to meet VRM Class II objectives. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

4.5.12.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on visual resources in the respective area is discussed in the following section.

BLM Vernal Field Office

The 6 miles of new utility corridor in the Vernal FO would be located in an area not previously developed for utilities and would allow for potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the new utility corridor would need to conform with VRM Class III objectives on public lands. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

4.5.12.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect these plan amendments would have on visual resources in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22 miles of new utility corridor in the Vernal FO to accommodate Alternative F would be located in an area not previously developed for utilities and would allow for potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. Alternative F crosses 54 acres managed with VRM Class II objectives, which accommodate only low levels of change to the landscape to retain the existing natural character and could not be reasonably mitigated to a level that would allow the large-scale aboveground utilities to meet VRM Class II objectives. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3 miles of new utility corridor in the Salt Lake FO would be located in an area not previously developed for utilities and would allow for potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the new utility corridor would need to conform with VRM Class objectives on public lands. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

4.5.12.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3 miles of new utility corridor for the Emma Park Alternative Variation would be located in an area not previously developed for utilities and would allow for potential future linear projects, which would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the new utility corridor would need to conform with VRM Class objectives on public lands. Siting utilities in multiple locations in the corridor would not be able to meet visual quality objectives after mitigation.

4.5.12.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on visual resources in the respective areas is discussed below.

BLM Rawlins Field Office

Designating new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile Point South (2 miles), and Mexican Flats (9 miles) alternative connectors would result in impacts to visual resources on public and non-federal lands and adjacent to areas that are within the viewshed, as stated above. None of the amended areas would be located within VRM Class I or II areas. Potential future projects proposed in the utility corridor would need to conform to the VRM Class III and IV objectives on public lands. Siting utilities in multiple locations along the corridor would not be able to meet visual quality objectives after mitigation.

BLM Las Vegas Field Office

The 1-mile, one-time exception for the Sunrise Mountain Alternative Connector through the Sunrise Mountain ISA would not allow for additional future linear projects. Therefore, no additional impacts would be anticipated from future development in this area. None of the amended areas would be located within VRM Class I or II areas.

4.5.13 Recreation Resources

Plan amendments to grant a new or expand an existing transmission line utility corridor, convert an existing underground corridor to aboveground, and alter a ROW exclusion area to an avoidance area, could affect recreation settings and experiences through additional permitted development. Altering the recreation setting would adversely affect visitors' recreation experiences and could lead to the displacement of some visitors to other areas or other parts of affected areas. Changing visitors' recreation experiences also may affect the recreation goals and objectives for certain areas as stated in the RMPs. Recreation impacts focus on SRMAs, Extensive Recreation Management Areas (ERMAs), and developed/undeveloped recreation sites.

Plan amendments to grant a new or expand an existing transmission line utility corridor could affect OHV recreation over time through concentrating additional permitted development that could affect the OHV-related goals and objectives near the corridors. Although ROWs sited within the corridors would likely lead to additional new access, new routes would be available for administrative use only and not for OHV recreation. OHV recreationists could be temporarily or permanently displaced due to the construction and location of the corridor, facilities, and access roads. OHV impacts focus on only OHV-related recreation. Increased access to maintain facilities in the utility corridors could also increase the potential for unauthorized OHV use.

Section 3.13, Recreation Resources, provides a detailed description of impacts to recreation resources within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.13.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on recreation in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

The expanded utility corridor along I-80 overlaps with 44 acres of the Continental Divide National Scenic Trail (CDNST); however, there are multiple utility and transportation facilities in the area. Expanding the utility corridor south of I-80 would alter the recreation setting for dispersed recreation uses that likely occur on undesignated public lands in the Western ERMA, which could displace some visitors.

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of limited to existing roads and vehicle routes within the checkerboard area; and the limited to designated roads and trails designation between the checkerboard area and the state line. In addition, the RMP OHV management goal and objectives would not be affected by the new utility corridor.

BLM Little Snake Field Office

Providing a 42-mile new utility corridor would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands and recreation uses at Sevenmile Ridge/Sand Wash Basin, which could interfere with access used by visitors to recreate in the area including those interested in viewing wild horses within the Sand Wash Basin. The new utility corridor would not affect the ERMA objectives in the RMP, which include providing direction and destination signing, focusing public land boundary signing on fragmented lands, and using education to further enhance resource protection.

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of limited to existing roads and trails nor would the transportation and access and travel management goals and objectives be affected.

BLM Vernal Field Office

Providing a 19-mile new utility corridor would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands, which could displace some visitors. The new utility corridor would not affect the goals and objectives for recreational resources as stated in the RMP or management of undesignated lands for dispersed recreation (RMP Management Decision REC-4).

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of limited to designated roads and trails nor would the travel management of roads and trails goals and objectives be affected.

BLM Las Vegas Field Office (Agency Preferred Alternative)

Allowing a 1-mile, one-time exception to add additional utilities to the existing corridor would further alter the recreation setting for dispersed recreation use that occurs in this area, which could displace some visitors. The one-time exception would conflict with the management of the Sunrise Mountain SRMA for recreation opportunities in concert with sensitive plant, scenic, cultural, and geologic values of the concurrent ACEC, as stated in the RMP. Thirty-three acres of the Sunrise Mountain SRMA would be overlapped by the amended area.

Assuming existing authorized OHV access through the utility corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities should not be affected. The one-time exception would not affect the area designation of limited to designated roads and trails in the Rainbow Gardens

ACEC/Sunrise Mountain ISA south of Highway 147; and limited to existing roads, trails, and dry washes north of Highway 147.

4.5.13.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on recreation in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

The expanded utility corridor along I-80 overlaps with 44 acres of the Continental Divide National Scenic Trail (CDNST) and new utility corridor south of I-80 is within the Western ERMA. Effects would be the same as described for Alternative A. Alternative B would also cross the Adobe Town Dispersed Recreation Use Area (DRUA) that is managed for middle and front country recreation uses with an emphasis on maintaining an undeveloped recreation setting. The new utility corridor designation would conflict with management in eastern portions of the DRUA within middle country settings, which provide for recreational with some isolation from sights and sounds of development.

Expansion and conversion of the utility corridor would not affect the RMP OHV designation of limited to existing roads and vehicle routes within the checkerboard area; and the limited to designated roads and trails designation between the checkerboard area and the state line. Effects to OHV would be the same as discussed for Alternative A.

BLM Little Snake Field Office

The 42-mile new utility corridor would alter the recreation setting for dispersed recreation uses at Sevenmile Ridge/Sand Wash Basin. Effects would be the same as described for Alternative A.

The new utility corridor would not affect the area designation of limited to existing roads and trails. Effects to OHV would be the same as discussed for Alternative A.

BLM White River Field Office

Expanding and converting the 38-mile existing utility corridor to allow overhead utilities would alter the recreation setting for dispersed recreation use on undesignated BLM lands as additional projects are approved within the corridor. The new utility corridor would not affect ERMA management as described in the RMP, which states that the ERMA will be managed custodially to provide an unstructured recreational opportunity.

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor would not be affected. Expansion and conversion of the utility corridor would not affect the area designation of limited to existing roads, ways, and trails on most of the public lands from October 1 through April 30; and the limited to designated roads, trails, and ways designation for the White River ACEC and an area south of Rangely. In addition, the RMP Motorized Vehicle Travel objective should not be affected by the new utility corridor.

BLM Vernal Field Office

Providing a new 6-mile utility corridor would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands, which could displace some visitors. The new utility corridor would not affect the goals and objectives for recreational resources as stated in the RMP or management of undesignated lands for dispersed recreation (RMP Management Decision REC-4).

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of limited to designated roads and trails nor would the travel management of roads and trails goals and objectives be affected.

BLM Price Field Office

Providing a 14-mile new utility corridor would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands and recreation uses, which could displace some visitors. A new corridor would not substantially affect the management goal for the ERMA to provide opportunities for a wide variety of recreation experiences, activities, and benefits in a manner that protects visitor health and safety, resource protection, and seek to reduce conflicts between other land uses and other recreation user groups due to the size of the ERMA and the variety of experiences provided within the ERMA.

Assuming existing authorized OHV access through the corridor is maintained, the ability of visitors to participate in authorized OHV recreation opportunities in the corridor would not be affected. The new utility corridor would not affect the area designation of limited to designated roads and trails. In addition, the RMP Recreation and OHV and the Transportation goals and objectives should not be affected by the new utility corridor.

4.5.13.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The effect these plan amendments would have on recreation in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

The expanded utility corridor along I-80 overlaps with 44 acres of the CDNST and the expanded utility corridor along Highway 789 is within the Western ERMA. Effects would be the same as described for Alternative A.

Expansion of the utility corridor would not affect the RMP OHV designation of limited to existing roads and vehicle routes within the checkerboard area; and the limited to designated roads and trails designation between the checkerboard area and the state line. Effects to OHV would be the same as discussed for Alternative A.

BLM White River Field Office

Impacts would be the same as stated above for Alternative B.

BLM Vernal Field Office

Impacts would be the same as stated above for Alternative B.

BLM Price Field Office

Providing a 10-mile new utility corridor would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands and recreation uses, which could displace some visitors. A new corridor would not substantially affect the management goal for the ERMA to provide opportunities for a wide variety of recreation experiences, activities, and benefits in a manner that protects visitor health and safety, resource protection, and seek to reduce conflicts between other land uses and other recreation user groups due to the size of the ERMA and the variety of experiences provided within the ERMA. However, 1,250 acres of the amended area would overlap with the San Rafael Swell SRMA.

The new utility corridor would not affect the RMP OHV designation of limited to designated roads and trails. Effects to OHV would be the same as discussed for Alternative B.

BLM Caliente Field Office

Allowing a 9-mile, one-time exception to add additional utilities to the existing corridor across the Kane Springs ACEC would further alter the recreation setting for dispersed recreation use that occurs in this area, which could displace some visitors. Expanding the corridor would affect the RMP recreation goal of providing quality settings for developed and undeveloped recreation experiences and opportunities while protecting resources.

Assuming existing authorized OHV access through the utility corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities would not be affected. The one-time exception would not affect the areas designation of limited to existing roads and trails. In addition, the RMP Travel Management goals and objective would not be affected.

USFS Fishlake National Forest

Expanding 22 miles of the utility corridor would allow a higher degree of alteration of recreation settings in this area in the future thus potentially altering the recreation setting for dispersed recreation uses, which could displace some visitors. The 22 miles of utility corridor that would require a plan amendment would overlap with areas within the forest that are utilized for various types of recreation. The amended area would overlap with 13,154 acres of roaded natural areas and 14,899 acres of semi-primitive motorized areas. Concentrating utilities in this area could result in decreased recreational experiences within the forest.

Expanding the existing utility corridor would not affect the overall LRMP off-road vehicle or motorized recreation-related goals and would not affect any route designations.

4.5.13.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on recreation in the respective areas is discussed in the following sections.

BLM Rawlins Field Office (Agency Preferred Alternative)

The expanded utility corridor along I-80 overlaps with 44 miles of the CDNST and the new utility corridor south of I-80 is within the Western ERMA. Effects would be the same as described for Alternative A.

Expansion of the utility corridor would not affect the RMP OHV designation of limited to existing roads and vehicle routes within the checkerboard area; and the limited to designated roads and trails designation between the checkerboard area and the state line. Effects to OHV would be the same as discussed for Alternative A.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Providing a new 17-mile utility corridor would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands, which could displace some visitors. The new utility corridor would not

affect the goals and objectives for recreational resources as stated in the RMP or management of undesignated lands for dispersed recreation (RMP Management Decision REC-4).

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of limited to designated roads and trails nor would the travel management of roads and trails goals and objectives be affected.

4.5.13.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on recreation in the respective area is discussed in the following section.

BLM Vernal Field Office

Providing a new 6-mile utility corridor would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands, which could displace some visitors. The new utility corridor would not affect the goals and objectives for recreational resources as stated in the RMP or management of undesignated lands for dispersed recreation (RMP Management Decision REC-4).

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of limited to designated roads and trails nor would the travel management of roads and trails goals and objectives be affected.

4.5.13.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect these plan amendments would have on visual resources in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22 miles of new utility corridor in the Vernal FO to accommodate Alternative F would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands, which could displace some visitors. The new utility corridor would not affect the goals and objectives for recreational resources as stated in the RMP or management of undesignated lands for dispersed recreation (RMP Management Decision REC-4).

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of limited to designated roads and trails nor would the travel management of roads and trails goals and objectives be affected.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3 miles of new utility corridor in the Salt Lake FO would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands, which could displace some visitors. The new utility corridor would not affect the unstructured types of recreation activities provided in the ERMA.

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of open to ORV use.

4.5.13.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3 miles of new utility corridor for the Emma Park Alternative Variation would alter the recreation setting for dispersed recreation uses that likely occur on undesignated lands, which could displace some visitors. The new utility corridor would not affect the unstructured types of recreation activities provided in the ERMA.

Assuming existing authorized OHV access through the corridor is maintained, the ability for visitors to participate in authorized OHV recreation opportunities in the corridor should not be affected. The new utility corridor would not affect the area designation of open to ORV use.

4.5.13.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on recreation in the respective areas is discussed below.

BLM Rawlins Field Office

The new utility corridor south of I-80 for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile Point South (2 miles), and Mexican Flats (9 miles) alternative connectors are within the Western ERMA. Effects would be the same as described for Alternative A.

Expansion of the utility corridor would not affect the RMP OHV designation of limited to existing roads and vehicle routes within the checkerboard area; and the limited to designated roads and trails designation between the checkerboard area and the state line. Effects to OHV would be the same as discussed for Alternative A.

BLM Las Vegas Field Office

Allowing a 1-mile, one-time exception to allow a transmission line would further alter the recreation setting for dispersed recreation use that occurs in this area, which could displace some visitors. The one-time exception would conflict with the management of the Sunrise Mountain SRMA for recreation opportunities in concert with sensitive plant, scenic, cultural, and geologic values of the concurrent ACEC, as stated in the RMP. Thirty acres of the Sunrise Mountain SRMA would be overlapped by the amended area.

The one-time exception would not affect the area designation of limited to designated roads and trails in the Rainbow Gardens ACEC/Sunrise Mountain ISA south of Highway 147; and limited to existing roads, trails, and dry washes north of Highway 147. Effects to OHV would be the same as discussed for Alternative A.

4.5.14 Land Use

Section 3.14 provides a detailed description of impacts to land use within the corridors proposed, plan amendment-specific impacts are addressed in the following sections. This section is subdivided into lands and realty and livestock grazing.

4.5.14.1 Lands and Realty

Plan amendments granting a new or expanded utility corridor or changing an exclusion area to an avoidance area would change the allowed uses and associated consequences for lands and realty as they are managed pursuant to BLM RMPs and USFS LRMPs. In all instances, the plan amendments proposed would lessen the restrictions currently in place, which would permit more flexibility for the

acquisition, disposal, withdrawal and use of public lands. The lands and realty management objectives were reviewed for the affected FOs where amendments are proposed. For some of the older RMPs that do not include lands and realty goals or direction, land management, ROW and/or utility corridor objectives were reviewed instead.

Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments for national forests are not required under this alternative. The effect these plan amendments would have on lands and realty in the respective areas is discussed in the following sections.

BLM Rawlins Field Office

The existing utility corridor proposed for expansion along I-80 currently contains one 115-kV transmission line. Additional high voltage transmission lines are proposed in the same corridor, as discussed in Chapter 5.0, Cumulative Impacts. There are currently no utilities located within the proposed 58 miles of newly designated corridor; however, other transmission projects are analyzing the route for potential siting. Expanding the existing utility corridor would allow for concentration of up to three additional future utilities to a common area; however, separation distances would restrict the amount of new utilities permitted within the corridor. Areas where a new above-ground utility corridor is established would permit up to five other utilities (power lines, communications, and renewable energy facilities) to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. The proposed corridor would not conflict with the ROW exclusion areas identified in Section 2.17 of the RMP, Lands and Realty Management Actions. In addition, the plan amendment would not prevent land tenure adjustments identified within the RMP-designated retention and disposal zones.

BLM Little Snake Field Office

Establishing a new 42-mile utility corridor to accommodate Alternative A would permit up to three other above-ground utilities to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. The proposed corridor would not conflict with the ROW exclusion areas identified in Section 2.17 of the RMP, Lands and Realty Management Actions. In addition, the plan amendment would not prevent land tenure adjustments identified within the RMP-designated retention and disposal zones.

BLM Vernal Field Office

Alternative A would cross 19 miles of public lands outside of designated WWEC and RMP-designated utility corridors. Utilities and utility corridors exist to the south and north of the new corridor; however, there are no utilities sited in the same location. A new utility corridor to accommodate Alternative A would permit other utilities (up to three additional electric transmission and distribution lines) to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. The proposed utility corridor would not be located within ROW exclusion areas or ROW-avoidance areas, which are specifically identified in the Lands and Realty Management chapter of the RMP as being set aside for the protection of natural resources. A new utility corridor would not prevent the sale (disposal) of public lands.

BLM Las Vegas Field Office (Agency Preferred Alternative)

The corridor through the Sunrise ISA/Rainbow Gardens ACEC/Sunrise Mountain SRMA contains high voltage transmission lines. Since the expansion through this area is a 1-mile, one-time exception, there would be no effects via the creation of opportunities for other utilities (powerlines, pipelines, communication sites) to be located within the ISA.

Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The effect these plan amendments would have on lands and realty in the respective resource management areas is discussed in the following sections.

BLM Rawlins Field Office

A total of 61 miles of utility corridor would require a plan amendment. The southern portion of Alternative B would be located in a designated utility corridor for underground utilities only, pursuant to the Rawlins RMP. There are existing underground pipelines located within the existing utility corridor, but there are no overhead transmission lines. Any high voltage transmission lines would require measures for cathodic protection to minimize impacts to existing underground utilities. Alternative B would not be located within any exclusion areas designated in the Rawlins RMP, or within any WSAs or SD/MAs.

BLM Little Snake Field Office

Establishing 37 miles of a new (aboveground) utility corridor for the Alternative B route would permit other utilities (power lines) to be located in an area where utilities and existing ROWs currently do not exist. The proposed corridor would not conflict with the ROW exclusion areas identified in Section 2.17 of the RMP, Lands and Realty Management Actions. Effects would be the same as described under Alternative A for lands and realty.

BLM White River Field Office

Expanding and converting 38 miles of the existing utility corridor to allow aboveground utilities would allow opportunities for up to four more utilities to be located in the corridor, depending on separation distance requirements. Any high voltage transmission lines would require measures for cathodic protection to minimize impacts to existing underground utilities. These plan amendments would not prevent the acquisition, disposal, withdrawal and use of public lands.

BLM Vernal Field Office

Establishing 6 miles of new utility corridor for the Alternative B route would permit other utilities to be located in an area where utilities and existing ROW currently do not exist. The proposed utility corridor would not be located within ROW exclusion or avoidance areas, which are specifically identified in the Lands and Realty Management chapter of the RMP as being set aside for the protection of natural resources. A new utility corridor would not prevent the sale (disposal) of public lands.

BLM Price Field Office

Alternative B would traverse an area where no utilities currently exist. Establishing 14 miles of a new utility corridor would permit other up to four utilities (power lines, and communication sites) to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. These plan amendments would be consistent with Land and Realty management decisions LAR-21, -25 and -26. LAR-21 requires that WSAs are utility corridor exclusion areas; Alternative B does not cross a WSA. LAR-25 and -26 list the avoidance and exclusion areas where new utility corridors cannot be located; none of those listed in the RMP are crossed by Alternative B. Plan amendments would not prevent the acquisition, disposal, withdrawal and use of public lands.

Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The effect plan amendments would have on lands and realty in the respective resource management areas is discussed in the following sections.

BLM Rawlins Field Office

The southern portion of Alternative C would be located in a designated utility corridor along Highway 789, pursuant to the Rawlins RMP. Expanding 27 miles of the existing utility corridor along Highway 789 would allow opportunities for up to three more utilities to be located in the corridor, depending on separation distance requirements. Alternative C would not be located within any exclusion areas designated in the Rawlins RMP, or within any WSAs or SD/MAs. Effects would be the same as described under Alternative A for lands and realty.

BLM White River Field Office

Effects to lands and realty as a result of converting to an aboveground corridor would be the same as for Alternative B described above.

BLM Vernal Field Office

Effects to lands and realty as a result of establishing a new 6-mile utility corridor would be the same as for Alternative B described above.

BLM Price Field Office

Alternative C would traverse an area where no utilities currently exist. Establishing 10 miles of a new utility corridor in this area would permit up to three other utilities (power lines, pipelines, and communication sites) to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. These plan amendments would be consistent with Land and Realty management decisions LAR-21, -25 and -26. Effects would be the same as described under Alternative B for lands and realty.

BLM Caliente Field Office

Alternative C parallels U.S. Highway 93, which contains multiple transmission and pipeline utilities between the National Wildlife Refuge and Delamar Wilderness Area. Since the expansion through this area is a 9-mile, one-time exception, there would be no effects or opportunities for other utilities (powerlines, pipelines, communication sites). The plan amendment would not prevent the acquisition, disposal, withdrawal and use of public lands pursuant to the lands and realty objectives of the RMP.

USFS Fishlake National Forest

The area proposed for expansion parallels I-70 to the north and an existing 345-kV transmission line to the south. Expansion of the 22-mile existing utility corridor would permit up to three other utilities (power lines, pipelines, and communication sites) to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. Allowing exceptions to areas of High SIO would reduce land management restrictions for siting linear right-of-way facilities within the national forest. The plan amendment would not conflict with the ROW standard of providing adequate forest access, or the ability of the USFS to acquire or exchange the use of public lands pursuant to other management direction of the Fishlake LRMP.

Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect plan amendments would have on lands and realty in the respective resource management areas is discussed in the following sections.

BLM Rawlins Field Office (Agency Preferred Alternative)

The existing 76-mile utility corridor proposed for expansion along I-80 currently contains a 115-kV transmission line and additional high voltage transmission lines are proposed in the same corridor. There are currently no utilities located within the newly designated corridor; however, other transmission projects are analyzing the route for potential siting, as discussed in Chapter 5.0. Establishing a new utility corridor in this area would permit up to three other utilities (power lines) to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. The proposed corridor would not conflict with the ROW exclusion areas identified in Section 2.17 of the RMP, Lands and Realty Management Actions. Effects would be the same as described under Alternative A for lands and realty.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as Alternative B.

BLM Vernal Field Office

Establishing 17 miles of new utility corridor for the Alternative D route would permit other utilities to be located in an area where utilities and existing ROW currently do not exist. The proposed utility corridor would not be located within ROW exclusion or avoidance areas, which are specifically identified in the Lands and Realty Management chapter of the RMP as being set aside for the protection of natural resources. A new utility corridor would not prevent the sale (disposal) of public lands.

Alternative E

The Alternative E route would require plan amendments involving one BLM office—Vernal. The effect plan amendment would have on lands and realty in the respective resource management area is discussed in the following sections.

BLM Vernal Field Office

Establishing 6 miles of new utility corridor for the Alternative E route would permit other utilities to be located in an area where utilities and existing ROW currently do not exist. The proposed utility corridor would not be located within ROW exclusion or avoidance areas, which are specifically identified in the Lands and Realty Management chapter of the RMP as being set aside for the protection of natural resources. A new utility corridor would not prevent the sale (disposal) of public lands.

Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect these plan amendments would have on lands and realty in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22 miles of new utility corridor in the Vernal FO to accommodate Alternative F would permit other utilities to be located in an area where utilities and existing ROW currently do not exist. The proposed utility corridor would not be located within ROW exclusion or avoidance areas, which are specifically

identified in the Lands and Realty Management chapter of the RMP as being set aside for the protection of natural resources. A new utility corridor would not prevent the sale (disposal) of public lands.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3 miles of new utility corridor in the Salt Lake FO would cross isolated parcels of public land managed under the Pony Express RMP. Providing a new utility corridor with a plan amendment to accommodate Alternative F could permit above-ground utilities to be located in an area where utilities and existing ROWs currently do not exist. The Pony Express RMP does not contain a Lands and Realty program; however, the Lands Program includes priorities for the disposal or exchange of public lands, primarily focused on the disposal of lands for agriculture, mineral development, community/public purposes, or for protection of resources (e.g., national forest, historic sites, military use). Since the proposed utility corridor does not fall within the category of “lands not available for ownership adjustment,” impacts to land management and real estate transactions would be minor.

Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The 3 miles of new utility corridor for the Emma Park Alternative Variation would cross isolated parcels of public land managed under the Pony Express RMP. Providing a new utility corridor with a plan amendment to accommodate Alternative F could permit above-ground utilities to be located in an area where utilities and existing ROWs currently do not exist. The Pony Express RMP does not contain a Lands and Realty program; however, the Lands Program includes priorities for the disposal or exchange of public lands, primarily focused on the disposal of lands for agriculture, mineral development, community/public purposes, or for protection of resources (e.g., national forest, historic sites, military use). Since the proposed utility corridor does not fall within the category of “lands not available for ownership adjustment,” impacts to land management and real estate transactions would be minor.

Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on lands and realty in the respective resource management areas is discussed below.

BLM Rawlins Field Office

New utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile Point South (2 miles), and Mexican Flats (9 miles) alternative connectors are proposed where no utilities currently exist; however, other transmission projects are analyzing the route for potential siting, as discussed in Chapter 5.0. Establishing a new utility corridor in this area would permit up to three other utilities (power lines) to be located in an area where utilities and existing ROWs currently do not exist, depending on separation distance requirements. The proposed corridor would not conflict with the ROW exclusion areas identified in Section 2.17 of the RMP, Lands and Realty Management Actions. Effects would be the same as described under Alternative A for lands and realty.

BLM Las Vegas Field Office

There are no existing utilities through the portion of the Sunrise ISA/Rainbow Gardens ACEC/Sunrise Mountain SRMA. Since the expansion through this area is a 1-mile, one-time exception, there would be no effects or opportunities for other utilities (powerlines, pipelines, communication sites).

4.5.14.2 Livestock Grazing

There would be little or no impacts on livestock grazing from plan amendment decisions. Plan amendments to create new utility or expand existing corridors would influence the ability to locate utilities in areas. These actions in turn have direct impacts on livestock grazing, which are analyzed pursuant to NEPA as individual projects are proposed. Allowing for potential future utilities to be developed in areas where currently none exist could affect the management of livestock on public lands as projects are developed. Short-term impacts would include vegetation removal and loss of AUMs during infrastructure construction; impacts to range improvements or the use of those range improvements such as fences, pipelines, troughs, reservoirs, corrals; generating construction and traffic-related dust; and an increased risk of animal/vehicle collisions from construction-related activities. Long-term impacts would include loss of AUMs from removal of vegetation with the existence of permanent facilities and an increased risk of animal/vehicle collisions from maintenance operations.

Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require land use plan amendments under this alternative. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

The following allotments would be overlapped by the amended area:

Rawlins FO, WY – Continental –Daley Ranch –Doty Mountain –Echo Springs –Lazy Y S Ranch –Mexican Graves –North Laclede –Pine Grove/Bolten –Powder Rim Rotation –Red Creek –Riner –Rotten Springs –Sand Creek –Sixteen Mile –South Barrel –South Laclede –South Wamsutter

Little Snake FO, CO –Cedar Springs Draw –Cross Mountain Disappointment –East Canyon –East Powder Wash –Grounds –Horse Draw –Lang Spring –Nipple Peak –Nipple Rim –Powder Rim Rotation –Powder Wash –Sand Wash –Sheepherder Spring –Snake River

Vernal FO, UT –Powder Wash –Snake John –Split Mountain –Walker Hollow –Ouray Road –Twelve Mile

Las Vegas FO, NV –Sunrise Mountain

Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Rawlins FO, WY –Continental –Daley Ranch –Echo Springs –Lazy Y S Ranch –Mexican Graves –North Barrel –North Laclede –Pine Grove/Bolten –Powder Rim Rotation –Riner –Rotten Springs –Sand Creek –Sixteen Mile –South Laclede –South Wamsutter –Willow Creek

Little Snake FO, CO –Cedar Springs Draw –East Powder Wash –Grounds –Horse Draw –Lang Spring –Nipple Peak –Nipple Rim –Powder Rim Rotation –Powder Wash –Sand Creek –Sand Hills –Sand Wash –Sheepherder Spring –Snake River –Suttles Basin

White River FO, CO –Atchee Ridge Amp – Cathedral Bluffs –Douglas Creek –Evacuation Creek –Hall Draw –Hatch Flat –Johnson/Trujillo –Lower Fletcher Draw –Massadona –Raven Park –Red Wash –Spooky Mountain –Spring Creek –Twin Buttes –West Salt Common

Vernal FO, UT –Atchee Ridge Amp, –Evacuation Creek

Price FO, UT –Elmo –Icelander –Marsing –Mathis Wash –Mounds –Mud Springs –North Olsen Lake –Oviatt –South Olsen Lake –Stalker –Victor –Washboard

Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Rawlins FO, WY –Adam's Ranch –Airheart Pasture –Baggs Subunit –Big Robber –Brimmer Pastures –Cedars –Cherokee –Coal Bank Wash –Cottonwood Hill –Dad –Daley Ranch –Doty Mountain –East Muddy –Echo Springs –George Dew –Grieve Pasture –Lazy Y S Ranch –Little Robber –Mexican Flats –Mexican Graves –North Baggs –North Pine Butte –Pine Grove/Bolten –Riner –Sixteen Mile –South Laclede –South Muddy –South Pasture –South Pine Butte –V Spreaders –Wagon Tongue

White River FO, CO –Atchee Ridge Amp – Cathedral Bluffs –Douglas Creek –Evacuation Creek –Hall Draw –Hatch Flat –Johnson/Trujillo –Lower Fletcher Draw –Massadona –Raven Park –Red Wash –Spooky Mountain –Spring Creek –Twin Buttes –West Salt Common

Vernal FO, UT –Atchee Ridge Amp –Evacuation Creek

Price FO, UT –Chimney Rock Flat, –Little Holes, –Lookoff –Summerville –Trail Springs –Beaver Dams –Browns Hole –Chicken Coop –Flat Top –Meadow Gulch –Moroni Peak –Saleratus

Caliente FO, NV –Delamar –Lower Lake East

Fishlake National Forest –Beaver Dams, –Browns Hole, –Flat Top, –Meadow Gulch, –South Water Hollow

Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Rawlins FO, WY –Big Robber –Big Robber Spreaders –Cottonwood Hill –Dad –Daley Ranch –Doty Mountain –Echo Springs –Lazy Y S Ranch –Mexican Flats –Mexican Graves –North Laclede –Oppenheimer –Pine Grove/Bolten –Poison Buttes –Powder Rim Rotation –Red Creek –Riner –Rotten Springs –Sand Creek –Sixteen Mile –South Barrel –South Flat Top –South Laclede –South Wamsutter

Little Snake FO, CO –Cedar Springs Draw –East Powder Wash –Grounds –Horse Draw –Lang Spring –Nipple Peak –Nipple Rim –Powder Rim Rotation, –Powder Wash, –Sand Creek –Sand Hills –Sand Wash–Sheepherder Spring –Snake River –Suttles Basin

Vernal FO, UT –Argyle Ridge –Big Wash –Currant Canyon –Five Mile –Lears Canyon –Parleys Canyon –Powder Wash –Snake John –Split Mountain –Sulfur Canyon –Water Canyon #2

Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Vernal FO, UT –Ouray Road –Powder Wash –Snake John –Split Mountain –Twelve Mile –West Fork

Alternative F

The Alternative F route would require a plan amendment involving two BLM offices—Vernal and Salt Lake. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Vernal FO, UT –Argyle Ridge –Big Wash –Currant Canyon –Five Mile –Lears Canyon –Parleys Canyon –Powder Wash –Snake John –Split Mountain –Sulfur Canyon –Water Canyon #1 –Water Canyon #2 –West Fork

Salt Lake FO, UT –Iso Tract –Ludlow –Kyune I –West Fork

Alternative Variations

The Emma Park Alternative Variation would require a plan amendment involving one BLM office—Salt Lake. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Salt Lake FO, UT –Cherry Creek –Kyune I –West Fork

Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs: Rawlins and Las Vegas. Concentrating utilities in the areas as proposed in the plan amendments would affect management of livestock on public lands as discussed above. However, proposed utilities would have to recognize valid existing rights and work with leaseholders to minimize conflicts.

Baggs Alternative Connector, Rawlins FO, WY –44 Ranch –Brimmer Pastures –Cottonwood Hill –North Baggs –Oppenheimer –Poison Buttes –Powder Rim Rotation –River Bottom

Fivemile Point North Alternative Connector, Rawlins FO, WY –Big Robber –Cottonwood Hill

Fivemile Point South Alternative Connector, Rawlins FO, WY –Cottonwood Hill

Mexican Flats Alternative Connector, Rawlins FO, WY –Adam's Ranch –Doty Mountain –Headquarters Ranch –Mexican Graves –South Laclede

Sunrise Mountain Alternative Connector, Las Vegas FO, NV –Sunrise Mountain

4.5.15 Special Designation and Management Areas

Plan amendments to expand an existing or create a new transmission line utility corridor could affect management objectives for special designations/management areas (SD/MAs). While some of the proposed and alternative corridors currently include portions of Wilderness Study Areas (WSAs) or wilderness areas, utilities would not be allowed in these areas unless Congressional approval is provided. The ROW is adjacent to the following areas:

- Oil Spring Mountain WSA (BLM White River FO, Alternatives B and C)
- Clover Mountains Wilderness (BLM Caliente FO, Alternative B)

The wilderness characteristics in these adjacent wilderness areas and WSAs may be temporarily diminished during construction of potential adjacent utility projects from noise associated with heavy machinery and increased traffic occurring near the wilderness area or WSA boundary. Visitors in adjacent wilderness areas or WSAs might notice a temporary disruption to solitude during construction. However, since all project construction would occur outside the wilderness area or WSA boundaries, no direct (permanent or physical) impacts to these areas are anticipated.

Section 3.15 provides a detailed description of impacts to SD/MAs within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.15.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments are not required for national forests under this alternative. No SD/MAs would be affected by the plan amendments proposed in the following areas: BLM Little Snake FO, and BLM Vernal FO. The proposed plan amendment that may affect SD/MAs is discussed in the following section.

<u>BLM Rawlins Field Office</u>

The 58-mile expanded utility corridor would overlap with 2,161 acres of the Red Rim-Daley WHMA and 880 acres of the Grizzly WHMA, which are ROW avoidance areas. Crossings of the CDNST and historic trails under study for national designation (Overland and Cherokee) would occur. Impacts are discussed in Section 3.15, Special Designation Areas.

<u>BLM Las Vegas Field Office (Agency Preferred Alternative)</u>

The 1-mile, one-time exception for an additional utility line in the existing corridor would affect the Sunrise Mountain ISA and Rainbow Gardens ACEC. According to the RMP, use of areas within the ISA is contingent upon Congressional action releasing the ISA from further wilderness consideration and study. Allowing additional ROWs within the ISA could affect the character of the ISA; however, the ISA was found to be in an unnatural condition and does not offer outstanding opportunities for solitude or primitive and unconfined recreation.

4.5.15.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. No SD/MAs would be affected by the plan amendments proposed in the following areas: BLM Little Snake FO, BLM Vernal FO, and BLM Price FO. The proposed plan amendment that may affect SD/MAs is discussed in the following section.

BLM Rawlins Field Office

The 61-mile expanded utility corridor would overlap with 2,161 acres of the Red Rim-Daley WHMA, which is a ROW avoidance area. Crossings of the CDNST and historic trails under study for national designation (Overland and Cherokee) would occur. Impacts are discussed in Section 3.15, Special Designation Areas.

BLM White River Field Office

The utility corridor is situated within 122 acres of the White River Riparian ACEC, which is a ROW avoidance area. Construction through the ACEC would be contingent upon avoidance of cottonwood communities, maintenance of utility as bald eagle habitat and properly functioning riparian community. Indirect impacts to 1,241 acres of the adjacent Oil Spring Mountain WSA from potential future construction within the utility corridor are discussed above.

4.5.15.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. No SD/MAs would be affected by the plan amendments proposed in the following areas: BLM Vernal FO, BLM Price FO, and USFS Fishlake National Forest. The proposed plan amendment that may affect SD/MAs is discussed in the following section.

BLM Rawlins Field Office

The 27-mile expanded utility corridor would overlap with 2,161 acres of the Red Rim-Daley WHMA and 880 acres of the Grizzly WHMA, which are ROW avoidance areas. Crossings of the CDNST and historic trails under study for national designation (Overland and Cherokee) would occur. Impacts are discussed in Section 3.15, Special Designation Areas.

BLM White River Field Office

The utility corridor is situated within 122 acres of the White River Riparian ACEC, which is a ROW avoidance area. Construction through the ACEC would be contingent upon avoidance of cottonwood communities, maintenance of bald eagle habitat and properly functioning riparian community. Indirect impacts to 1,241 acres of the adjacent Oil Springs Mountain WSA from potential future construction within the utility corridor are discussed above.

BLM Caliente Field Office

A 9-mile, one-time exception to allow an additional utility in the corridor through the Kane Springs ACEC would affect the values of the ACEC. A total of 279 acres of the Kane Springs ACEC would be overlapped by the amended area. According to the RMP, the Kane Springs ACEC will be managed primarily for the recovery of the desert tortoise, which could be affected by additional ROWs through critical habitat within the ACEC. Please see Section 4.5.14 for additional impacts to special status species from the plan amendment. Indirect impacts to the adjacent Delamar Mountains Wilderness Area from potential future construction within the utility corridor are discussed above.

4.5.15.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. No SD/MAs would be affected by the plan amendments proposed in the Little Snake FO.

BLM Rawlins Field Office

The 76-mile utility corridor would overlap with 2,161 acres of the Red Rim-Daley WHMA and 880 acres of the Grizzly WHMA, which are ROW avoidance areas. Crossings of the Continental Divide National Scenic Trail and historic trails under study for national designation (Overland and Cherokee) would occur. Impacts are discussed in Section 3.15, Special Designation Areas.

BLM Vernal Field Office

The 17-mile utility corridor would cross 54 acres of the Lower Green River Corridor ACEC. The area is managed as ROW avoidance area for protection of riparian and special status species habitat and scenic values.

4.5.15.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. No SD/MAs would be affected by the plan amendments proposed in this area.

4.5.15.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect these plan amendments would have on special designations in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The 22 miles of new utility corridor in the Vernal FO to accommodate Alternative F would cross 54 acres of the Lower Green River Corridor ACEC. The area is managed as ROW avoidance area for protection of riparian and special status species habitat and scenic values.

BLM Salt Lake Field Office (Agency Preferred Alternative)

The 3 miles of new utility corridor in the Salt Lake FO would not affect SD/MAs.

4.5.15.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. The three miles of new utility corridor for the Emma Park Alternative Variation would not affect SD/MAs.

4.5.15.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on SD/MAs in the respective areas is discussed below. No SD/MAs would be affected by the plan amendments proposed in the BLM Rawlins FO. The proposed plan amendment that may affect SD/MAs is discussed in the following section.

BLM Las Vegas Field Office

The one-time exception for an additional utility line in the existing corridor would affect the Sunrise Mountain ISA and Rainbow Gardens ACEC. According to the RMP, use of areas within the ISA is contingent upon Congressional action releasing the ISA from further wilderness consideration and study. Allowing additional ROWs within the ISA could affect the character of the ISA; however, the ISA was found to be in an unnatural condition and does not offer outstanding opportunities for solitude or primitive and unconfined recreation.

4.5.16 Transportation and Access

In general, a plan amendment creating a new utility corridor would allow for potential future developments that require new road construction and road upgrades to provide access to utility system alignments, staging areas and related facilities. The new roads would extend from the existing roadway network into areas previously without roads. The road upgrades would increase safety and/or capacity of the existing roads and change maintenance needs and long-term requirements. The new roads and the existing roads would be used by utility construction, operation, maintenance, and decommissioning vehicles during the life cycle of each utility installation. Some new roads would remain in place for maintenance and could be added to the road inventory for the administering agency depending on identified needs. No conflicts with airports or air travel would be expected, except where the new corridors would be located within military operation areas. Section 3.16 provides a detailed description of impacts to transportation and access within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.16.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above. Additional effects are discussed in the following section.

<u>BLM Las Vegas Field Office (Agency Preferred Alternative)</u>

A 1-mile, one-time exception through the Sunrise Mountain ISA could result in indirect effects from potential additional development as stated above. Utilities in the Sunrise Mountain ISA could affect military operations associated with Nellis AFB, the NTTR, and the Nellis Small Arms Range/Jettison Hill boundaries. Potential future aboveground utilities could disrupt military activity and could be damaged by military activity creating financial and system reliability impacts. However, there is an existing aboveground facility in this location through the Sunrise Mountain ISA. In addition, utility repair and maintenance may be prevented by military operations. The presence of utilities also may adversely impact low-level fixed and rotary wing flying operations.

4.5.16.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.16.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. Plan amendments for utility corridors could result in effects from potential additional development as stated above. Additional effects are discussed in the following section.

<u>BLM Caliente Field Office</u>

A 9-mile, one-time exception through the Kane Springs ACEC could result in indirect effects from potential additional development as stated above. Utilities in the Kane Springs ACEC could affect military operations associated with Nellis AFB and the NTTR. Potential future aboveground utilities could disrupt military activity and could be damaged by military activity creating financial and system reliability impacts. However, there is an existing aboveground facility in this location adjacent to the Kane Springs ACEC. In

addition, utility repair and maintenance may be prevented by military operations. The presence of utilities also may adversely impact low-level fixed and rotary wing flying operations.

4.5.16.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.16.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.16.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. Plan amendments for utility corridors could result in effects from potential additional developed as stated above.

4.5.16.7 Alternative Variations

The various alternative variations would require plan amendments involving the following FO—Salt Lake. Plan amendments for a new utility corridor for the Emma Park Alternative Variation could result in effects from potential additional developed as stated above.

4.5.16.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above. Additional effects are discussed in the following section.

<u>BLM Las Vegas Field Office</u>

A 1-mile, one-time exception through the Sunrise Mountain ISA could result in indirect effects from potential additional development as stated above. Utilities in the Sunrise Mountain ISA could affect military operations associated with Nellis Air Force Base (AFB), the Nevada Test and Training Range (NTTR), and the Nellis Small Arms Range (SAR)/Jettison Hill boundaries, as discussed under Alternative A.

4.5.17 Social and Economic Conditions

There would be little or no impacts on socioeconomics from plan amendment decisions. Plan amendments to create new utility or expand existing corridors would influence the ability to locate utilities in areas. These actions in turn have direct impacts on socioeconomics, which are analyzed pursuant to NEPA as individual projects are proposed. Designation of utility corridors would facilitate processing of ROW applications; however, these projects would be proposed whether or not a corridor was designated. Indirect effects to other revenue sources, such as recreation, hunting, and livestock operations, could occur in localized areas if users are displaced as a result of concentrated ROW development. Section 3.17 provides a detailed description of impacts to social and economic conditions within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.17.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.17.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.17.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.17.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.17.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.17.6 Alternative F

The Alternative F route would require plan amendments in two BLM offices—Vernal and Salt Lake. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.17.7 Alternative Variations

The Emma Park Alternative Variation would require a plan amendment in the BLM Salt Lake FO. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.17.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. Plan amendments for utility corridors could result in effects from potential additional development as stated above.

4.5.18 Public Health & Safety

There would be little or no impacts on public health and safety from plan amendment decisions. Plan amendments to create new utility or expand existing corridors would influence the ability to locate utilities in areas. These actions in turn have direct impacts on public health and safety, which are analyzed pursuant to NEPA as individual projects are proposed. Anticipated public health and safety risks from proposed utility projects would include worker accidents, fire, electrocution, exposure to hazardous

materials, exposure to electric fields and magnetic fields (EMF), communication disturbances caused by corona, impacts from stray and induced voltage, and noise. Potential risks from the future proposed utilities in the corridors would be considered minor because previously established requirements for utilities and utility corridors would be expected to remain in place, would be modified as needed if new risks were identified, and the requirements would continue to effectively avoid, minimize and mitigate anticipated public health and safety risks. Section 3.18 provides a detailed description of public health and safety impacts to resources within the corridors proposed, plan amendment-specific impacts are addressed in the following sections.

4.5.18.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. No national forests require plan amendments under this alternative. The proposed plan amendments would have minor and inconsequential effects for all these areas because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.18.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. Plan amendments are not required for national forests under this alternative. The proposed plan amendments would have minor and inconsequential effects for all these areas because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.18.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and one national forest—Fishlake. The proposed plan amendments would have minor and inconsequential effects for all these areas because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.18.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The proposed plan amendments would have minor and inconsequential effects for all these areas because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.18.5 Alternative E

The Alternative E route would require plan amendments involving one BLM office—Vernal. The proposed plan amendments would have minor and inconsequential effects for this area because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.18.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The proposed plan amendments would have minor and inconsequential effects for all these areas because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.18.7 Alternative Variations

The Emma Park Alternative Variation would require a plan amendment in the BLM Salt Lake Office. The proposed plan amendment would have minor and inconsequential effects for this area because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.18.8 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. The proposed plan amendments would have minor and inconsequential effects for all these areas because previously established requirements for utilities and utility corridors would be expected to remain in place for project proposed in the utility corridor as discussed above.

4.5.19 Wild Horses Management Areas

Allowing for potential future development of utilities in areas where currently none exist could affect the management of wild horses and burros on public lands. Effects to wild horses and burros consist of temporary and permanent displacement of vegetation due to construction of infrastructure, interference with access to water sources, and overall disturbance due to construction noise and human presence (usually only an issue during foaling season). Depending on the location of the overhead power lines they may have a negative effect on BLM's ability to gather excess wild horses in areas where wild horses occupy the landscape.

4.5.19.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. The effect these plan amendments would have on wild horses and burros in the respective FO is discussed below.

<u>BLM Rawlins Field Office</u>

The new utility corridor traverses the Adobe Town HMA. Wild horses may experience increased stress from human presence and noise, and viewers could be displaced. If the location is critical to BLM's ability to gather wild horses, overhead utilities in the corridor could affect BLM's ability to effectively manage horses.

<u>BLM Little Snake Field Office</u>

The new utility corridor traverses the eastern portion of the Sand Wash HMA and would be located directly over a County Road 75, which is a primary route for public wild horse viewing. Wild horses may experience increased stress from human presence and noise, and viewers could be displaced. If the location of the corridor is critical to BLM's ability to gather wild horses, overhead utilities in the corridor could affect BLM's ability to effectively manage wild horses.

<u>BLM Vernal Field Office</u>

The Bonanza HA is located south of the corridor; therefore, there would be no effects to HAs in this FO.

<u>BLM Las Vegas Field Office (Agency Preferred Alternative)</u>

The Muddy Mountains HMA is located east of the corridor; therefore, there would be no effects to HMAs in this FO.

4.5.19.2 Alternative B

The Alternative B route would require plan amendments involving five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. The effect these plan amendments would have on wild horses and burros in the respective FOs is discussed below.

BLM Rawlins Field Office

The Adobe Town HMA is located within the corridor; therefore, impacts would the same as described in Alternative A.

BLM Little Snake Field Office

The Sand Wash HMA is located to the west of the corridor; therefore, there would be no effects to HMAs in this FO.

BLM White River Field Office

The utility corridor intersects the, Piceance/East Douglas HMA as well as the North Piceance and West Douglas herd areas, which could be affected during construction by the loss of vegetation and cover until reclamation is successful. Wild horses may experience increased stress from human presence and noise. If the location of the corridor is critical to BLM's ability to gather wild horses, overhead utilities in the corridor could affect BLM's ability to effectively manage wild horses.

BLM Vernal Field Office

No HAs are intersected by the corridor; therefore, there would be no effects to this FO.

BLM Price Field Office

No HMAs are intersected by the corridor; therefore, there would be no effects to this FO.

4.5.19.3 Alternative C

The Alternative C route would require plan amendments involving five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. The effect these plan amendments would have on wild horses and burros in the respective BLM offices and national forest is discussed below.

BLM Rawlins Field Office

The Adobe Town HMA is located west of the corridor; therefore, there would be no effects to HMAs in this FO.

BLM White River Field Office

Effects to wild horses and burros would be the same as for Alternative B described above.

BLM Vernal Field Office

Effects to wild horses and burros would be the same as for Alternative B described above.

BLM Price Field Office

No HMAs are intersected by the corridor; therefore, there would be no effects to this FO.

BLM Caliente Field Office

The Silver King and Eagle HMAs are located approximately ten miles north of the area of the one-time exception; therefore, there would be no effects to HMAs in this FO.

USFS Fishlake National Forest

Wild horses and burros do not exist in the forest; therefore, there would be no effect to wild horses and burros.

4.5.19.4 Alternative D

The Alternative D route would require plan amendments involving three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on wild horses and burros in the respective BLM offices is discussed below.

BLM Rawlins Field Office (Agency Preferred Alternative)

The new utility corridor traverses a small portion of the Adobe Town HMA. Wild horses may experience increased stress from human presence and noise, and viewers could be displaced. If the location is critical to BLM's ability to gather wild horses, overhead utilities in the corridor could affect BLM's ability to effectively manage horses.

BLM Little Snake Field Office

Impacts would be the same as Alternative B.

BLM Vernal Field Office

The Hill Creek HA is located approximately 17 miles east of the area proposed for amendment. Therefore, no effects to HAs from the amendment are anticipated in this FO.

4.5.19.5 Alternative E

The Alternative E route would require a plan amendment involving one BLM office—Vernal. The effect the plan amendment would have on wild horses and burros in the respective BLM office is discussed below.

BLM Vernal Field Office

No HMAs are intersected by the corridor; therefore, there would be no effects to this FO.

4.5.19.6 Alternative F

The Alternative F route would require plan amendments involving two BLM offices—Vernal and Salt Lake. The effect the plan amendment would have on wild horses and burros in the respective BLM office is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

The Hill Creek HA is located approximately 17 miles east of the area proposed for amendment. Therefore, no effects to HAs from the amendment are anticipated in this FO.

BLM Salt Lake Field Office (Agency Preferred Alternative)

No HMAs are intersected by the corridor; therefore, there would be no effects to this FO.

4.5.19.7 Alternative Variations

The Emma Park Alternative Variation would require a plan amendment in the BLM Salt Lake Office. No HMAs are intersected by the corridor; therefore, there would be no effects to this FO.

4.5.19.1 Alternative Connectors

The various alternative connectors would require plan amendments involving the following FOs—Rawlins and Las Vegas. A description of the involved routing variations and the effect the plan amendments would have on wild horses and burros in the respective FOs is discussed below.

BLM Rawlins Field Office

There are no HMAs/HAs affected by the Mexican Flats, Baggs, Fivemile Point North, and Fivemile Point South alternative connectors. The Adobe Town HMA is located west of the corridor; therefore, there would be no effects to HMAs in this FO.

BLM Las Vegas Field Office

The Sunrise Mountain Alternative Connector intersects the Sunrise Mountain ISA, which is an exclusion area. Allowances would have to be made (change the area designation from ROW exclusion to ROW avoidance) to develop a utility ROW through this area. There would be no effects to wild horses and burros as a result of the Sunrise Mountain Alternative Connector.

4.5.20 Lands with Wilderness Characteristics

Establishing utility corridors in areas containing inventory units that are determined to meet criteria for LWC could lead to potential future development of utilities that could affect LWC units and eliminate portions or the entirety of the unit from meeting LWC criteria. Impacts could either result from the loss of wilderness characteristics in areas that the BLM has administratively made a decision to protect or negate the eligibility of the whole inventoried area for consideration in a future planning effort for wilderness character protection.

4.5.20.1 Alternative A

The Alternative A route would require plan amendments involving four BLM offices—Rawlins, Little Snake, Vernal, and Las Vegas. The effect these plan amendments would have on LWC in the respective FO is discussed below.

BLM Rawlins Field Office

No LWC units would be affected by the proposed plan amendment.

BLM Little Snake Field Office

Eight LWC units (290, 291, 318, 332, 351, 353, 364, 409) would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part or the entirety of the unit may not meet the LWC criteria for size, solitude, and naturalness.

BLM Vernal Field Office

No LWC units would be affected by the proposed plan amendment.

BLM Las Vegas Field Office (Agency Preferred Alternative)

Alternative A traverses the Sunrise Mountain ISA, but no LWC units would be affected by the proposed plan amendment.

4.5.20.2 Alternative B

The Alternative B route would require plan amendments for five BLM offices—Rawlins, Little Snake, White River, Vernal, and Price. The effect these plan amendments would have on LWC in the respective FO is discussed below.

BLM Rawlins Field Office

One LWC unit (WY-030-13N95W24-2012 – Rotten Springs) would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part or the entirety of the unit may not meet the LWC criteria for size, solitude, and naturalness.

BLM Little Snake Field Office

Eight LWC units (290, 291, 318, 353, 364, 406, 407, 409) would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part or the entirety of the unit may not meet the LWC criteria for size, solitude, and naturalness.

BLM White River Field Office

Three LWC units (2, 7, 21) would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part or the entirety of the unit may not meet the LWC criteria for size, solitude, and naturalness.

BLM Vernal Field Office

One LWC unit (Bitter Creek), which is not managed for wilderness character as determined through the RMP, would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part or the entirety of the unit may not meet the LWC criteria for size, solitude, and naturalness.

BLM Price Field Office

One LWC unit (Price River), which is not managed for wilderness character as determined through the RMP, would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part of the unit may not meet the LWC criteria for size, solitude, and naturalness.

4.5.20.3 Alternative C

The Alternative C route would require plan amendments for five BLM offices—Rawlins, White River, Vernal, Price, and Caliente—and Fishlake National Forest. The effect these plan amendments would have on LWC in the respective BLM FO is discussed below. There are no LWC units on national forests.

BLM Rawlins Field Office

No LWC units would be affected by the proposed plan amendment.

BLM White River Field Office

Impacts would be the same as discussed for Alternative B.

BLM Vernal Field Office

Impacts would be the same as discussed for Alternative B.

BLM Price Field Office

Three LWC units (Lost Springs Wash, Never Sweat Wash, Sids Mountain), which are not managed for wilderness character as determined through the RMP, would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part of the unit may not meet the LWC criteria for size, solitude, and naturalness.

BLM Caliente Field Office

No LWC units would be affected by the proposed plan amendment.

4.5.20.4 Alternative D

The Alternative D route would require plan amendments for three BLM offices—Rawlins, Little Snake, and Vernal. The effect these plan amendments would have on LWC in the respective BLM FO is discussed below.

BLM Rawlins Field Office (Agency Preferred Alternative)

No LWC units would be affected by the proposed plan amendment.

BLM Little Snake Field Office (Agency Preferred Alternative)

Impacts would be the same as discussed for Alternative B.

BLM Vernal Field Office

One LWC unit (Currant Canyon) would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part or the entirety of the unit may not meet the LWC criteria for size, solitude, and naturalness.

4.5.20.5 Alternative E

The Alternative E route would require plan amendments for one BLM office—Vernal. The effect these plan amendments would have on LWC in the respective BLM FO is discussed below.

BLM Vernal Field Office

No LWC units would be affected by the proposed plan amendment.

4.5.20.6 Alternative F

The Alternative F route would require plan amendments for two BLM offices—Vernal and Salt Lake. The effect these plan amendments would have on LWC in the respective BLM FO is discussed below.

BLM Vernal Field Office (Agency Preferred Alternative)

One LWC unit (Currant Canyon) would be affected by the proposed plan amendment. Depending on the location of utilities as they are developed, part or the entirety of the unit may not meet the LWC criteria for size, solitude, and naturalness.

BLM Salt Lake Field Office (Agency Preferred Alternative)

No LWC units would be affected by the proposed plan amendment.

4.5.20.7 Alternative Variations

The Emma Park Alternative Variation would require a plan amendment for the BLM Salt Lake FO. No LWC units would be affected by the proposed plan amendment.

4.5.20.8 Alternative Connectors

The various alternative connectors would require plan amendments in the following FOs—Rawlins and Las Vegas. The effect these plan amendments would have on LWC in the respective BLM FO is discussed below.

BLM Rawlins Field Office

Designation of new utility corridors for the Baggs (18 miles), Fivemile Point North (2 miles), Fivemile South (2 miles), and Mexican Flats (9 miles) alternative connectors would not affect any LWC units as a result of the proposed plan amendments.

BLM Las Vegas Field Office

The alternative connector traverses the Sunrise Mountain ISA, but no LWC units would be affected by the proposed plan amendment.

5.0 Cumulative Impacts

NEPA requires an assessment of potential cumulative impacts. Federal regulations (40 CFR 1500-1508) define cumulative impacts as:

> "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The same resources evaluated for Project effects (Chapter 3.0) are evaluated for cumulative effects. The cumulative impact discussion assumes that all environmental mitigation measures discussed in Chapter 3.0 would be applied to the Project as well as other reasonably foreseeable transmission lines proposed on federal lands in the same alternative corridors. It also is assumed that these and any other projects on federal lands would comply with the applicable BLM Land Use Plans and Forest Service Forest Plans, as well as applicable federal, state, and local regulations and permit requirements.

The structure and content of the cumulative impacts analysis in this EIS follows the guidance contained in the BLM NEPA handbook (BLM 2008) and the CEQ Guidance on Considering Cumulative Effects Under the National Policy Act (CEQ 1997).

5.1 Physical and Temporal Boundaries of Cumulative Impacts

In general, physical boundaries for cumulative impacts analysis vary by resource and would be identical to those analysis areas used in Chapter 3.0 to determine the context of project impacts.

Temporal effects are measured over the length of the effect to the resource, not the Project life. For example, certain desert vegetation communities would require more than 100 years to recover to a similar species composition and cover after surface disturbance as before disturbance. For the purposes of analysis, it was assumed that project operational life would be indefinite with a minimum of 50 years.

5.1.1 Overview of Related Actions

As described in Chapter 2.0, the Project primarily would convey electricity generated from existing and reasonably foreseeable renewable and non-renewable energy sources in central Wyoming to market in Southern Nevada. As a HVDC line, the Project would not interconnect with other electricity suppliers between Wyoming and Nevada. The Project would potentially interconnect with the Gateway West and Gateway South transmission lines near the north terminal.

The Chokecherry Sierra Madre Wind Energy Project Final EIS (BLM 2012a) and the Gateway West Transmission Project Final EIS (BLM 2013) described and evaluated past, present, and foreseeable projects within a region extending from the vicinity of the Medicine Bow River near Hanna (Aeolus substation) south and west to Sinclair and Rawlins, and west along the I-80 corridor to the vicinity of Wamsutter in Carbon and Sweetwater counties, Wyoming. The Project was included in the cumulative impacts section of both documents. Additionally, this Final EIS incorporates by reference their analysis of the cumulative impacts of past, present, and foreseeable actions that would impact the same resources as the Project. Although this Project potentially would transmit power generated by the Chokecherry project, it potentially also would transmit power from other sources. Similarly, in the event that this Project is not approved, the Chokecherry project would use other transmission options. Accordingly, these projects are not connected as either one could proceed without the other.

As a background document for regional energy development and transportation, the Gateway West Final EIS provides an extensive overview of the electrical power generation sources in Wyoming and Idaho, including fossil fuel power plants (coal and natural gas), wind energy, geothermal, and hydroelectric sources. The regional electrical transmission system requirements for transporting wind energy also are discussed. The existing and proposed Wyoming generation sources described in the Gateway West Final EIS (see Sections 4.2.1.4 and 4.2.2.5 of the Gateway West Final EIS) eventually could be potentially served by the Project if the demand arose.

In the Las Vegas region, several transmission lines have been proposed, but none have yet been approved or constructed. The NEPA analyses for these transmission lines were reviewed for project description information and they are discussed under the Region IV discussion below.

5.2 Past and Present, and Reasonably Foreseeable Future Actions

Past and present actions for the Project include existing land development, the results of which are described under the various resources in Chapter 3.0. The past and present actions are discussed in terms of regional distribution of land uses and activities. Maps of linear utilities within each region have been developed to provide the reader with the relative extent of aboveground facility development within the various corridors.

The following sections outline the past and present actions by the Project regions defined for analysis of alternatives, as well as reasonably foreseeable actions that may cause cumulative impacts.

Reasonably foreseeable projects that overlap with the Project in space and time are identified by project alternative and are illustrated on maps. Reasonably foreseeable projects include any projects that are actively proposed or planned and impact the same resources as the Project. The criteria for inclusion of reasonably foreseeable projects in the list for analysis are the following:

- A ROW application and associated preliminary project description have been filed with the BLM or other federal agency, and there is evidence that the project is being actively pursued by the proponent through the NEPA or other permitting process. Project construction activities may or may not overlap with those of the Project.
- The foreseeable project would be located where it would impact the same resources as the Project.

Cumulative impacts are estimated for each resource by Project region. The primary focus of the specific analyses are locations where cumulative projects and actions may conflict with the management of designated areas, private land uses, other industrial surface uses (e.g., oil and gas), and protection of habitats for special status species and other resources. In most cases, these cumulative impacts include past, present, and reasonably foreseeable actions that extend beyond the common corridor of the Project and other transmission lines to include the logical boundaries for a baseline for those resources impacted by the Project.

5.2.1 Region I

5.2.1.1 Past and Present Actions

- Agriculture. The majority of the land crossed by all alternatives is used for livestock grazing. Dryland wheat fields and irrigated pasturelands are located north and west of Craig in Moffat County, Colorado (**Figure 3.5-1**).
- Commercial, Residential, and Industrial Areas. Incorporated and unincorporated communities in Wyoming (in order of size) include Rawlins, Sinclair, Hanna, Wamsutter, and Baggs; in Colorado, Craig, Maybell, and Dinosaur; and in Utah, Vernal. A coal-fired power plant is located near Craig, and an oil refinery is located in Sinclair.

- Oil and Gas Field Development. An extensive area of oil and gas development is located from the vicinity of Rawlins westward to Wamsutter, and southward to the vicinity of Baggs (**Figure 3.2-3**). Example existing large fields include Atlantic Rim, Continental Divide-Creston, and Desolation Flats. These fields are composed of well pads, gathering pipelines, electrical distribution lines, buried pipelines, and access roads. Access roads are subject to daily traffic that includes light and heavy trucks, water trucks, truck and trailer rigs, and motor graders.
- Minerals. Active surface and underground coal mines are located north and south of Craig and north of Rangely (**Figure 3.2-3**).
- Renewable Energy. No operating renewable energy projects (wind, solar) overlap with Project alternative corridors.
- Linear Utilities. **Figure 5-1** provides an overview of the linear utilities associated with Project corridors in this region. The I-80 corridor includes a variety of linear utilities within a few miles of the interstate highway. These include a transcontinental railroad; multiple pipelines (oil, natural gas, natural gas liquids, and refined products); transmission lines; and fiber optic communication lines. Compressor stations and pump stations are associated with individual pipelines, depending on the type of product. Other state and federal highways that also serve as utility corridors include: U.S. Highway 287, and State Highways 30 and 789 in Wyoming, U.S. Highway 40 between Craig and Vernal in Colorado and Utah, and Highway 191 between I-80 in Wyoming and U.S. Highway 40 in Utah.
- Other Actions. Other facilities within Project corridors include a Wyoming state prison south of Rawlins.

An estimate of the Region Analysis Areas that have been disturbed from past and present activities was made by mapping historical vegetation conditions using the potential natural vegetation (PNV) dataset from the USFS General Technical Report RMRS-87 *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management*. This PNV dataset from this report is based on the Kuchler dataset developed in the 1960's (Kuchler 1975). This PNV was overlaid with current SWReGAP and NWReGAP land cover data (USGS 2008, 2004) and an estimate was made of the acreage of PNV in the Region I Analysis Area that has been converted to developed areas. A summary of these acreages by vegetation/habitat cover type is provided below in **Table 5-1**. The cumulative qualitative effect of these past actions on existing resources is disclosed through the description of the Affected Environment for each resource (Chapter 3.0 of this Draft EIS). Please note that these numbers differ slightly from the existing affected environment numbers expressed in **Table 5-1** because they were calculated from a different dataset. However, the discrepancy is very small and does not preclude comparison of the numbers in terms of estimating overall cumulative impacts. This is true for the identical information expressed for all of the regions.

Table 5-1 Estimated Cumulative Impacts from Past and Present Actions in the Region I Analysis Area

Vegetation/Habitat Cover Type	Region 1 Currently Disturbed (acres)	Region 1 Historic Vegetation/Habitat	Percent Disturbed from Past and Present Actions
Barren/Sparsely Vegetated	-	-	-
Conifer Forest	8,222	123,241	7
Desert Shrubland	3,292	430,857	<1
Grassland	162	1,979	8
Montane Shrubland	19,625	315,636	6
Open Water	-	771	-

Table 5-1 Estimated Cumulative Impacts from Past and Present Actions in the Region I Analysis Area

Vegetation/Habitat Cover Type	Region 1 Currently Disturbed (acres)	Region 1 Historic Vegetation/Habitat	Percent Disturbed from Past and Present Actions
Pinyon-Juniper	36,496	750,202	5
Sagebrush Shrubland	193,772	3,727,772	5
Total	**261,569**	**5,350,458**	**5**

5.2.1.2 Reasonably Foreseeable Actions

Figure 5-1 illustrates the geographic relationships of the Project alternatives and other RFFAs in Region I. **Table 5-2** provides a summary of the types of projects, estimated construction time frames, and their potential cumulative impacts relationships.

Table 5-2 Reasonably Foreseeable Future Actions in Region I

Type of Project	Construction Time Frame	Project/Description
Transmission Line	2015-2018	PacifiCorp Gateway West – 500-kV AC. Glenrock, Wyoming, to Melba, Idaho.
Transmission Line	2015-2018	PacifiCorp Gateway South – 500-kV AC. Aeolus, Wyoming, to Mona, Utah
Oil and Gas Field Development	2012 Ongoing	Proposed and ongoing development of oil and gas fields including Continental Divide-Creston, Hiawatha, Atlantic Rim, and Catalina Unit
Chokecherry-Sierra Madre Wind Energy Development	2013-2016	Power Company of Wyoming – Potential development of 1,000 wind turbines on private lands and lands managed by the BLM Rawlins.

Figure 5-2 identifies potential cumulative impact constraint areas in Region I, which are identified and discussed in greater detail, by applicable resource, in Sections 5.3.1 through 5.3.19.

A summary of the cumulative effects of RFFAs on the Region I Analysis Area are shown in **Table 5-3**.

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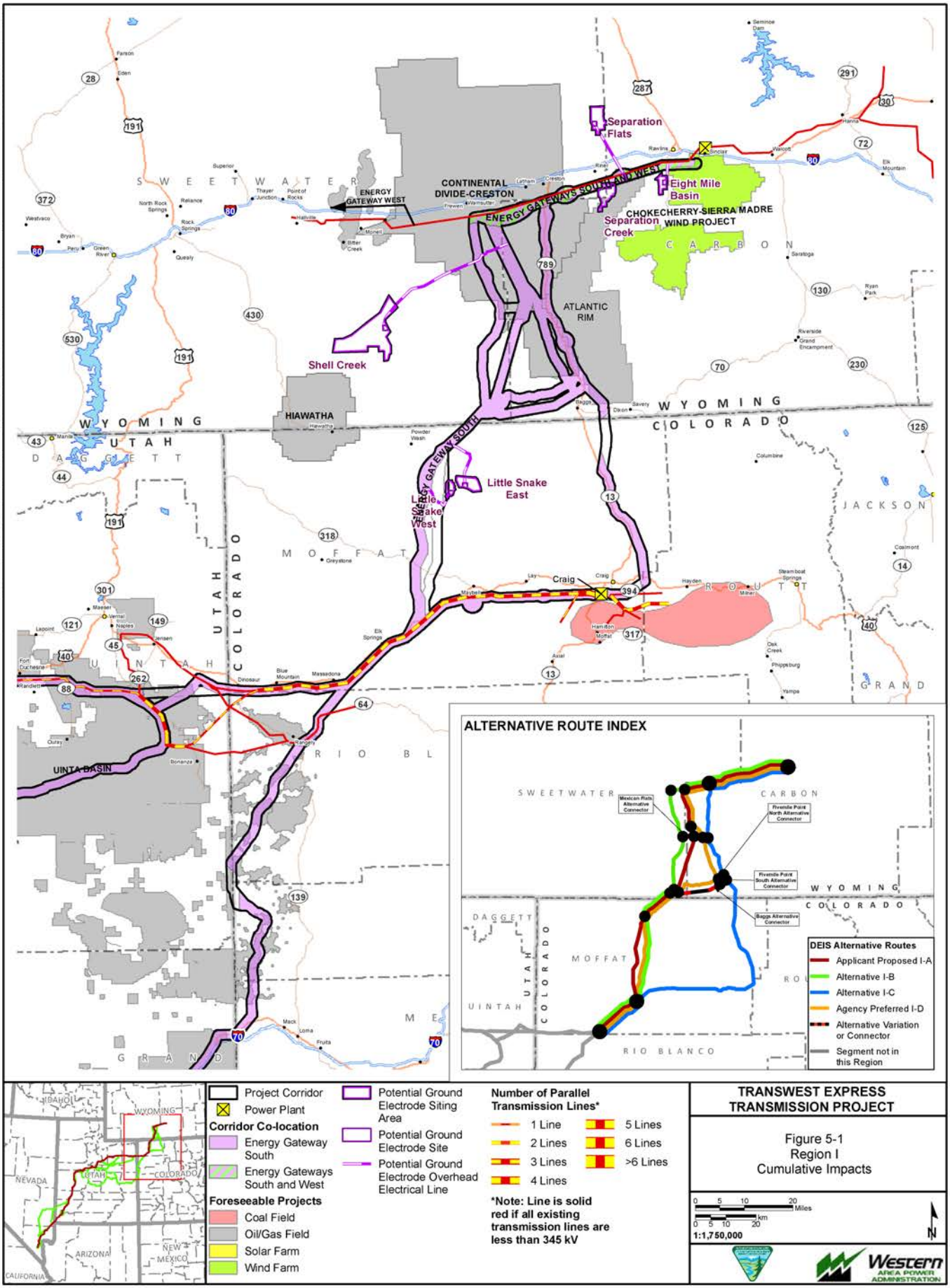

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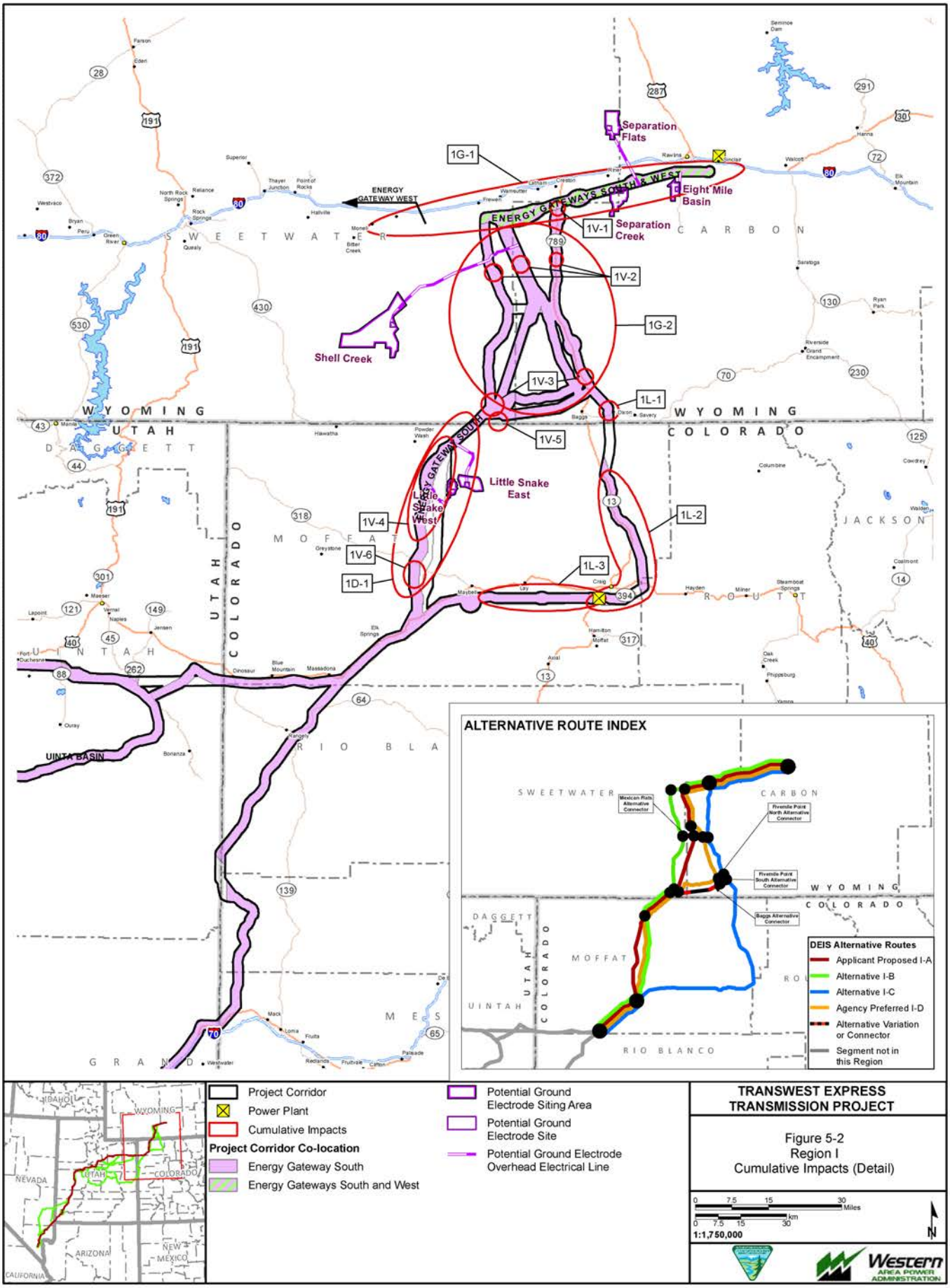
Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake East
Little Snake West
ENERGY GATEWAY WEST
ENERGY GATEWAYS SOUTH & WEST
ENERGY GATEWAY SOUTH
1G-1
1V-1
1V-2
1G-2
1V-3
1L-1
1V-5
1L-2
1V-4
1V-6
1D-1
1L-3
UINTA BASIN
WYOMING
UTAH
COLORADO
SWEETWATER
CARBON
MOFFAT
JACKSON
ROUTT
RIO BLANCO
GRAND
MESA
DAGGETT
UINTAH
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Fivemile Point South Alternative Connector
Baggs Alternative Connector
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Project Corridor
Power Plant
Cumulative Impacts
Project Corridor Co-location
Energy Gateway South
Energy Gateways South and West
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
CALIFORNIA
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 5-2
Region I
Cumulative Impacts (Detail)
0 7.5 15 30 Miles
0 7.5 15 30 km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
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Table 5-3 Estimated Cumulative Impacts from RFFAs in the Region I Analysis Area

Vegetation Cover Type	RFFA Disturbance to Region I Analysis Area	Total Vegetation in Region I Analysis Area (acres)	Percent Cumulative Disturbance from RFFA	Percent Additional Disturbance from Project Alternatives
Agriculture	98	230,482	<1	<1
Aspen Forest and Woodland	-	89,921	-	<1
Barren/Sparsely Vegetated	171	36,819	<1	<1
Cliff/Canyon	95	29,704	<1	<1
Conifer Forest	18	35,190	<1	<1
Deciduous Forest	-	39	-	<1
Desert Shrub	-	-	-	<1
Developed/Disturbed	123	107,794	-	<1
Dunes	685	85,276	1	<1
Grassland	526	210,626	<1	<1
Greasewood Flat	1,250	90,502	1	<1
Herbaceous Wetland	242	25,146	1	<1
Montane Grassland	-	3,788	-	<1
Montane Shrubland	-	117,240	<1	<1
Open Water	11	11,332	<1	<1
Pinyon-Juniper Woodland	111	303,173	<1	<1
Riparian	-	728	-	<1
Sagebrush Shrubland	36,332	3,038,971	1	<1
Saltbush Shrubland	13,461	885,851	2	<1
Tundra	-	-	-	-
Woody Riparian and Wetlands	766	47,858	2	<1
Total	**53,889**	**5,350,440**	**<1**	**<1**

5.2.2 Region II

5.2.2.1 Past and Present Actions

- Agriculture. The majority of the land crossed by all alternatives is used for livestock grazing. Irrigated pasturelands are located along rivers and streams that drain the south flank of the Uinta Mountains in Uintah and Duchesne Counties, Utah. Alternative corridors cross irrigated lands in intermountain valleys near Nephi, Mount Pleasant, Fairview, Salina, Castle Dale, and Delta (**Figure 3.5-2**).
- Commercial, Residential, and Industrial Areas. Incorporated and unincorporated communities in Colorado include Dinosaur and Rangely. Communities along U.S. Highway 40 near the Project corridors in the Uinta Basin of Utah include Vernal, Fort Duchesne, Roosevelt, Duchesne, and

Fruitland. Communities along the I-70 corridor include Green River and Salina. Communities located near alternatives extending from the I-70 corridor to Nephi include Castle Dale, Huntington, Mt. Pleasant, Fairview, and Fountain Green. Coal-fired power plants are located near Huntington in Emery County and Delta in Millard County.

- Oil and Gas Field Development. An extensive area of oil and gas development is located in the Uinta Basin from the Colorado/ Utah border to the vicinity of Fruitland. Example existing large fields south of U.S. Highway 40 include Red Wash, Horseshoe Bend, Blue Bell, Monument Butte, and Altamont (**Figure 3.2-8**).
- Minerals. Active underground coal mines are located on the Wasatch Plateau west of Huntington in Emery County and north of Rangely (**Figure 3.2-8**).
- Renewable Energy. No existing operating renewable energy projects (wind, solar) overlap with the Project's analysis area of potential impacts.
- Linear Utilities. **Figure 5-3** provides an overview of the linear utilities associated with the Project corridors in this region. The U.S. Highway 40 corridor includes a variety of linear utilities. These include multiple pipelines (oil, natural gas) and transmission lines. Other state and federal highways that also serve as utility corridors include: U.S. Highway 6 from Green River to Spanish Fork, and I-70 from the Colorado/Utah border to Salina.

A summary of the cumulative current disturbance from past and present actions in the Region II analysis area is shown in **Table 5-4**. The cumulative effect of these past actions on existing resources is expressed through the baseline description for each resource (Chapter 3.0 of this Draft EIS).

Table 5-4 Estimated Cumulative Impacts from Past and Present Actions in the Region II Analysis Area

Vegetation/Habitat Cover Type	Region II Currently Disturbed (acres)	Region II Historic Vegetation/Habitat	Percent Disturbed from Past and Present Actions
Barren/Sparsely Vegetated	18,704	942,442	2
Conifer Forest	6,214	1,099,061	<1
Desert Shrubland	506,989	3,142,774	16
Grassland	-	877	-
Montane Shrubland	36,213	498,817	7
Open Water	288	5,148	6
Pinyon-Juniper	172,668	4,568,083	4
Sagebrush Shrubland	145,379	863,083	17
Total	**886,455**	**11,120,285**	**8**

5.2.2.2 Reasonably Foreseeable Actions

Figure 5-3 illustrates the geographic relationships of the Project alternatives and other reasonably foreseeable projects in Region II. **Table 5-5** provides a summary of the types of projects, estimated construction time frames, and their potential cumulative impacts relationships.

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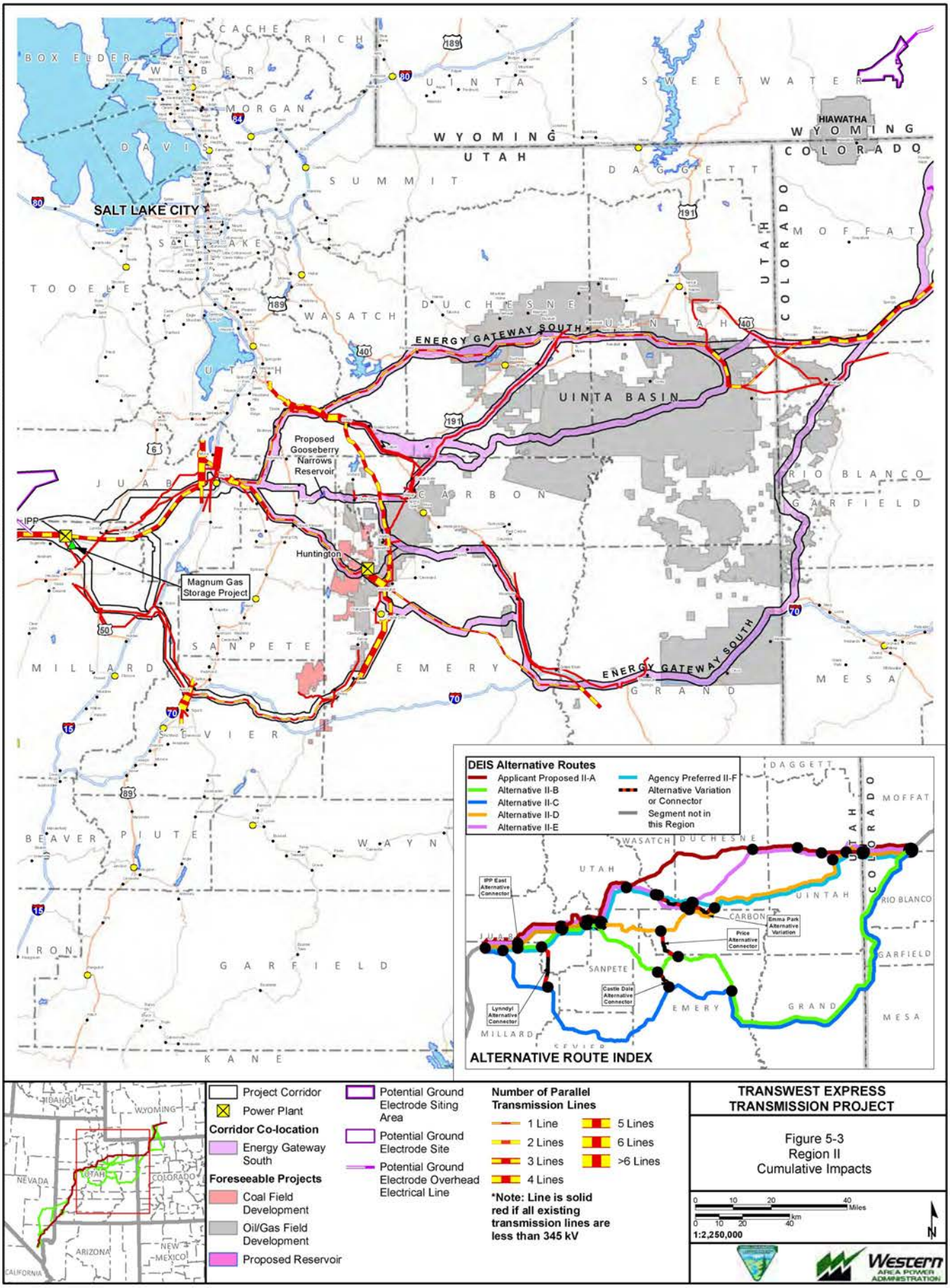

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Table 5-5 Reasonably Foreseeable Future Actions in Region II

Type of Project	Construction Time Frame	Project/Description
Transmission Line	2015 – 2018	PacifiCorp Gateway South – 500-kV AC. Aeolus, Wyoming to Mona, Utah
Transmission Line	2011 – 2013	PacifiCorp Mona To Oquirrh – 500/345-kV AC. Mona Substation in Juab County, Utah, to the Oquirrh Substation, the Terminal Substation in Salt Lake County, Utah, and the Clover Substation near Mona, Utah.
Pipeline	2012 – 2013	Mid America Pipeline – 16-inch pipeline from Dragon in Uintah County, Utah, to Thompson Station in Grand County , Utah
Oil and Gas Development	2012 – ongoing	Eleven new and infill natural gas projects located generally south of the White River, and east of the Green River in Uintah County, Utah. One oil field project in the Pariette drainage west of the Green River. Largest projects in terms of surface disturbance and well numbers: KMG Greater Natural Buttes, EOG Greater Chapita Wells, West Tavaputs, Newfield Monument Butte, Gasco Uinta Basin, and the Berry Petroleum Ashley South Unit development on Ashley National Forest.
Underground Coal	2012 – ongoing	There are lease modifications for Cottonwood, Deer Creek II Tracts on Manti-La Sal National Forest. Additionally, there is a submitted application for the Deserado Mine Coal lease.
Vegetation Treatments	2012 – ongoing	Both the USFS and the BLM have numerous fuels treatment and/or prescribed fire projects planned that would affect the same resources as the Project. These include the Pine Springs Fuels Treatment, Bottom Canyon Fuels Reduction, Moonshine Hazardous Fuel Reduction, Shalom Timber Harvest, Uinta Sheep Creek Project, and Millers Flat Timber Harvest.
Water Development	2013	Construction of a 17,000-acre-foot dam and impoundment on Gooseberry Creek in Sanpete County, Utah.

A summary of the disturbance impacts to the Region II Analysis area from the RFFAs described above is given in **Table 5-6**.

Table 5-6 Estimated Cumulative Impacts from RFFAs in the Region II Analysis Area

Vegetation Cover Type	RFFA Disturbance to Region II Analysis Area	Total Vegetation in Region II Analysis Area (acres)	Percent Cumulative Disturbance from RFFA	Percent Additional Disturbance from TWE Alternatives
Agriculture	-	484,528	-	<1
Aspen Forest and Woodland	3,976	544,114	<1	<1
Barren/Sparsely Vegetated	1,045	222,948	<1	<1
Cliff/Canyon	702	565,493	<1	<1
Conifer Forest	19,410	477,815	4	<1
Deciduous Forest	-	13,869	-	<1
Desert Shrub	1,176	125,982	1	<1
Developed/Disturbed	478	459,785	<1	<1
Dunes	428	32,567	1	<1

Table 5-6 Estimated Cumulative Impacts from RFFAs in the Region II Analysis Area

Vegetation Cover Type	RFFA Disturbance to Region II Analysis Area	Total Vegetation in Region II Analysis Area (acres)	Percent Cumulative Disturbance from RFFA	Percent Additional Disturbance from TWE Alternatives
Grassland	2,933	519,056	1	<1
Greasewood Flat	496	511,410	<1	<1
Herbaceous Wetland	122	80,634	<1	<1
Montane Grassland	134	65,241	<1	<1
Montane Shrubland	1,192	570,993	<1	<1
Open Water	-	61,376	-	<1
Pinyon-Juniper Woodland	6,735	2,483,995	<1	<1
Riparian	-	-	-	<1
Sagebrush Shrubland	20,205	2,307,131	1	<1
Saltbush Shrubland	5,869	1,468,576	<1	<1
Tundra	-	13,956	-	<1
Woody Riparian Wetlands	247	110,822	<1	<1
Total	**65,148**	**11,120,291**	**1**	**<1**

Figure 5-4 identifies potential cumulative impact constraint areas in Region II, which are identified and discussed in greater detail, by applicable resource, in Sections 5.3.1 through 5.3.19

5.2.3 Region III

5.2.3.1 Past and Present Actions

- Agriculture. The majority of the land crossed by all alternatives is used for livestock grazing.
- Commercial, Residential, and Industrial Areas. Incorporated and unincorporated communities in Utah from north to south include Delta, Milford, Newcastle, Enterprise, and Central. Nevada communities include Caliente and Alamo along the U.S. 93 corridor and Moapa along the I-15 corridor. Coal-fired power plants are located near Delta, Utah, and Moapa, Nevada. An industrial complex located near Apex, northeast of Las Vegas, includes the Harry Allen and Silverhawk natural gas power plants and a cement plant.
- Renewable Energy. First Wind's Milford Wind Corridor Project is located north of the community of Milford, in both Beaver and Millard counties, approximately 1 mile east of the Project alternative corridors. Phase I (Beaver County) and Phase II (Millard County) are constructed and operating. Phase III (Millard and Beaver County), which is located on private land, is on hold due to the expiration of production tax credits. Phase IV (Millard County), which is on BLM, private, and state land, currently is on a temporary hold by the Fillmore FO.

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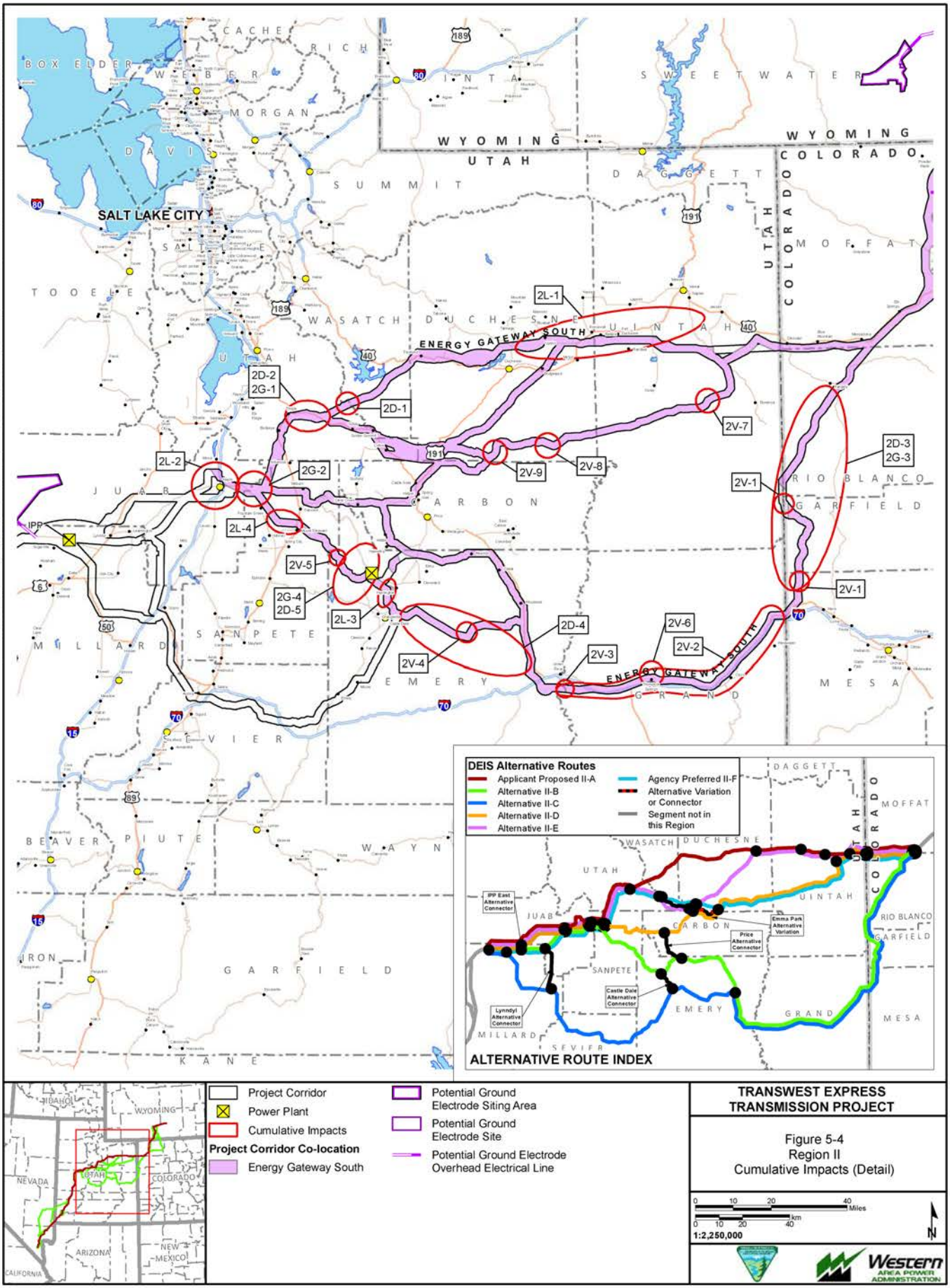

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- Linear Utilities. **Figure 5-5** provides an overview of the linear utilities associated with Project corridors in this region. From Delta, Utah, to Apex, Nevada, in Clark County, the Proposed Action would follow an existing utility corridor that includes multiple transmission lines, and pipelines. The Kern River natural gas pipeline is located within this corridor; the UNEV refined products pipeline was recently constructed in this corridor segment between Milford and Central. Alternative III-C in Utah (Segment 490) would parallel an active railroad, but no other utilities. From Caliente, Nevada, south to Apex, Nevada, Alternative III-C (Segment 520) would be located in the Lincoln County Conservation Recreation and Development Act (LCCRDA) utility corridor that was designated by the U.S. Congress. This corridor currently contains transmission lines and U.S Highway 93. Lincoln County Power District maintains 138- and 67-kV transmission lines that run parallel with and/or cross portions of the Project alternative corridors.

An estimate of the impacts to the Region III Analysis Area from past and present activities is provided in **Table 5-7**. The cumulative effect of these past actions on existing resources is expressed through the description of the Affected Environment for each resource (Chapter 3.0 of this Draft EIS).

Table 5-7 Estimated Cumulative Impacts from Past and Present Actions in the Region III Analysis Area

Vegetation/Habitat Cover Type	Region III Currently Disturbed (acres)	Region III Historic Vegetation/Habitat	Percent Disturbed from Past and Present Actions
Barren/Sparsely Vegetated	5,065	1,336,583	<1
Conifer Forest	260	35,077	1
Desert Shrubland	115,375	3,047,504	4
Grassland	-	-	-
Montane Shrubland	-	4,946	-
Open Water	15,743	70,614	22
Pinyon-Juniper	17,033	2,086,763	<1
Sagebrush Shrubland	44,334	736,896	6
Total	**197,810**	**7,318,383**	**3**

5.2.3.2 Reasonably Foreseeable Actions

Figure 5-5 illustrates the geographic relationships of the Project alternatives and other reasonably foreseeable projects in Region III. **Table 5-8** provides a summary of the types of projects, estimated construction time frames, and their potential cumulative impacts relationships.

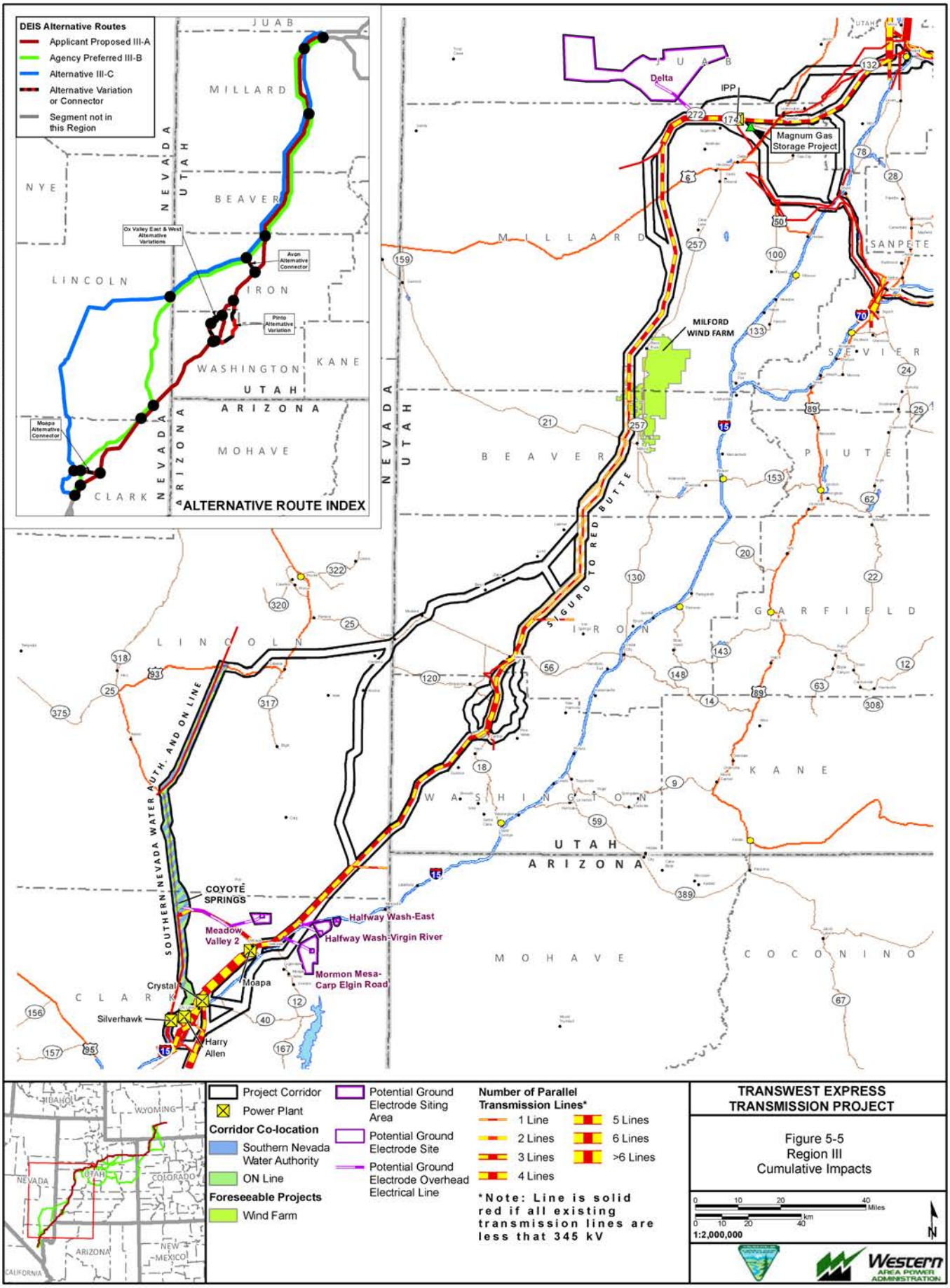
DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
ALTERNATIVE ROUTE INDEX
Ox Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
Delta
IPP
Magnum Gas Storage Project
MILFORD WIND FARM
SIGURD TO RED BUTTE
SOUTHERN NEVADA WATER AUTH. AND ON LINE
COYOTE SPRINGS
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
Crystal
Moapa
Silverhawk
Harry Allen
Project Corridor
Power Plant
Corridor Co-location
Southern Nevada Water Authority
ON Line
Foreseeable Projects
Wind Farm
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
Number of Parallel Transmission Lines*
1 Line
2 Lines
3 Lines
4 Lines
5 Lines
6 Lines
>6 Lines
*Note: Line is solid red if all existing transmission lines are less that 345 kV
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 5-5
Region III
Cumulative Impacts
1:2,000,000
Western AREA POWER ADMINISTRATION
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Table 5-8 Reasonably Foreseeable Future Actions in Region III

Type of Project	Construction Time Frame	Project/Description
Transmission Line	2013-2015	PacifiCorp Sigurd to Red Butte 345 kV AC from Sigurd Substation in Sevier County, Utah to Red Butte Substation in Washington County, Utah
Transmission Line	2011-2012	ON 500 kV AC transmission line (under construction in 2011) Southern Idaho to Harry Allen Power Plant near Apex, Nevada.
Transmission Line	2012-2015	K Road Solar. Tie in from solar facility to the BLM administered utility corridor on the Moapa Paiute Reservation to an interconnection at Crystal Substation.
Transmission Line	2012- 2013	Silver State Energy Associates Eastern Nevada Project 230 kV AC. Proposed from U.S 93 Gemmil Substation to Tortoise Substation on Moapa Paiute Reservation.
Water Pipeline and Transmission Line	2013-2050	Southern Nevada Water Authority Clark, Lincoln, and White Pine counties Groundwater Development Project. Proposed groundwater development in five hydrologic basins in Lincoln and White Pine Counties, and a pipeline system to deliver water to the Las Vegas urban area. Project terminates at a water delivery terminal west of Apex.
Natural Gas Storage	2012 - 2014	Magnum Gas Storage Project gas storage facility directly south of IPP. Includes four proposed underground salt caverns to store natural gas, Project also includes required above-ground facilities, including a 36-inch natural gas pipeline from Elberta, Utah to the proposed gas storage site.
Renewable Energy	Unknown	Bright Source Solar Energy Project, Coyote Springs Valley; Millford Wind Corridor Project Phase III (Millard and Beaver County), located on private land, is to be constructed this year. Phase IV (Millard County) is currently on a temporary hold by the Fillmore FO.

A summary of the disturbance impacts to the Region III Analysis area from the RFFAs described above is given in **Table 5-9**. The cumulative effect of these past actions on existing resources is expressed through the description of the Affected Environment for each resource (Chapter 3.0 of this Draft EIS).

Table 5-9 Estimated Cumulative Impacts from RFFAs in the Region III Analysis Area

Vegetation Cover Type	RFFA Disturbance	Total Vegetation in Region III Analysis Area (acres)	Percent Cumulative Disturbance from RFFA	Percent Additional Disturbance from TWE Alternatives
Agriculture	79	69,423	<1	<1
Aspen Forest and Woodland	-	7,448	-	<1
Barren/Sparsely Vegetated	3	29,338	<1	<1
Cliff and Canyon	10	164,119	<1	<1
Conifer Forest	-	26,599	-	<1
Deciduous Forest	1	26	4	<1
Desert Shrub	7,806	2,227,441	<1	<1

Table 5-9 Estimated Cumulative Impacts from RFFAs in the Region III Analysis Area

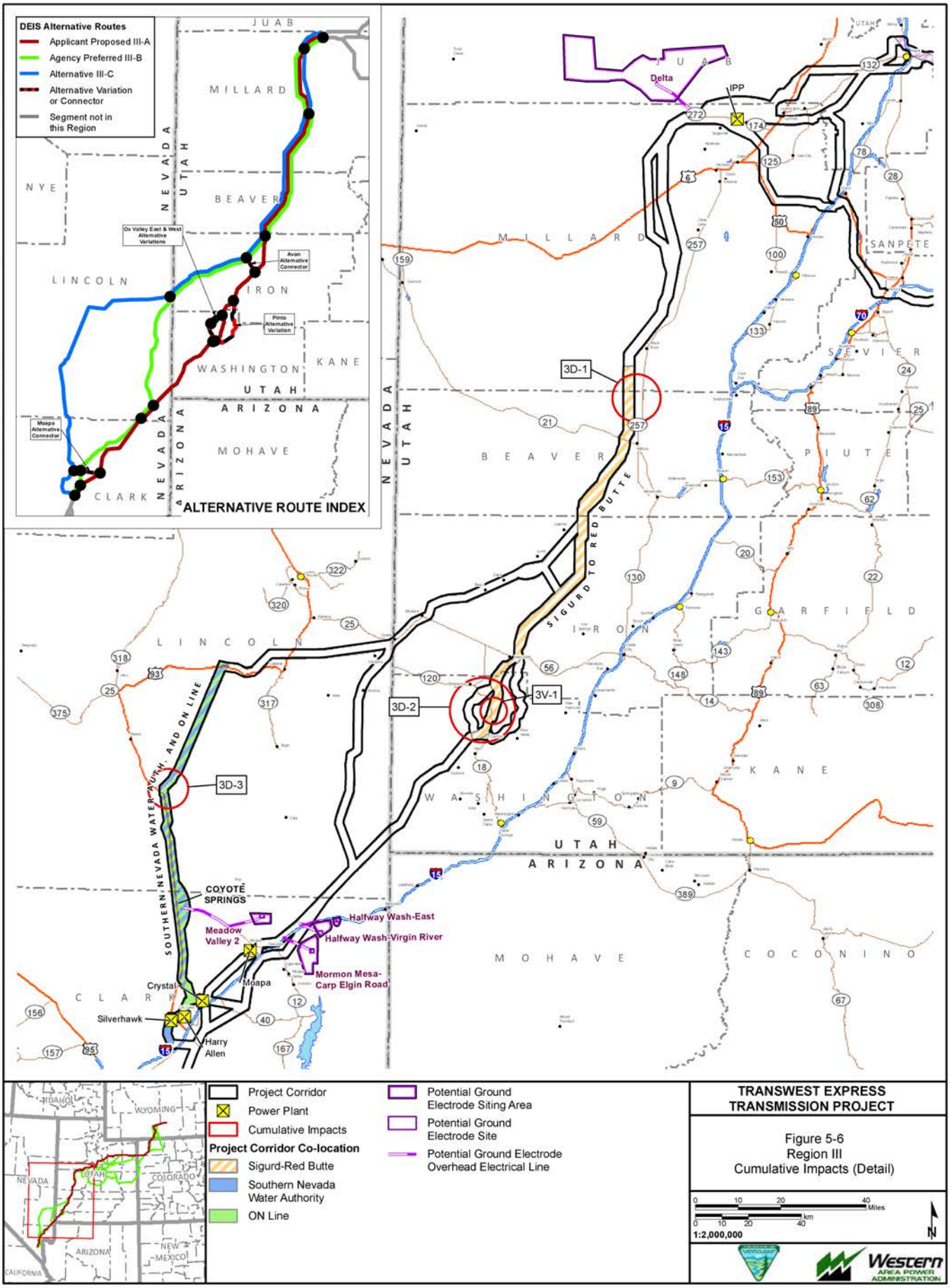
Vegetation Cover Type	RFFA Disturbance	Total Vegetation in Region III Analysis Area (acres)	Percent Cumulative Disturbance from RFFA	Percent Additional Disturbance from TWE Alternatives
Developed/Disturbed	36	180,970	<1	<1
Dunes	-	15,313	<1	<1
Grassland	535	801,113	<1	<1
Greasewood Flat	75	274,079	<1	<1
Herbaceous Wetland	27	81,741	<1	<1
Montane Grassland	-	1,284	-	<1
Montane Shrubland	32	187,059	<1	<1
Open Water	-	12,281	-	<1
Pinyon-Juniper	534	1,292,483	<1	<1
Riparian	8	65,185	<1	<1
Sagebrush Shrubland	6,762	1,192,955	1	<1
Saltbush Shrubland	3,374	635,456	1	<1
Tundra	-	-	-	<1
Woody Riparian and Wetlands	8	54,368	<1	<1
Total	**19,290**	**7,318,681**	**<1**	**<1**

Figure 5-6 identifies potential cumulative impact constraint areas in Region III, which are identified and discussed in greater detail, by applicable resource, in Sections 5.3.1 through 5.3.19.

5.2.4 Region IV

5.2.4.1 Past and Present Actions

- Commercial, Residential, and Industrial Areas. Project alternatives (within existing utility corridors) would pass through and adjacent to residential and commercial areas in Lake Las Vegas and Henderson, Nevada. Other regional alternatives would pass through the Lake Mead National Recreation Area, and would bypass the community of Boulder City. A natural gas power plant is located adjacent to the Marketplace Substation in the Eldorado Valley.
- Renewable Energy. Two solar electric projects are located adjacent to the Marketplace Substation in the Eldorado Valley.
- Linear Utilities. **Figure 5-7** provides an overview of the linear utilities associated with the Project corridors in this region. The Mead, Marketplace, and Eldorado Substations represent major regional hubs for electrical energy distribution in the Southwest U.S. A very wide existing transmission corridor currently traverses the east side of the Las Vegas Valley to the Eldorado Valley. Transmission lines in this corridor primarily deliver power from interstate lines originating in the Rocky Mountain region. A second wide transmission corridor connects the hydropower facilities at Hoover Dam and regional power plants with the Eldorado Valley substations.


DEIS Alternative Routes
Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
ALTERNATIVE ROUTE INDEX
Ox Valley East & West Alternative Variations
Avon Alternative Connector
Pinto Alternative Variation
Moapa Alternative Connector
Delta
IPP
3D-1
3D-2
3V-1
3D-3
COYOTE SPRINGS
Meadow Valley 2
Halfway Wash-East
Halfway Wash-Virgin River
Mormon Mesa-Carp Elgin Road
Moapa
Crystal
Silverhawk
Harry Allen
SIGURD TO RED BUTTE
SOUTHERN NEVADA WATER AUTH. AND ON LINE
Project Corridor
Power Plant
Cumulative Impacts
Project Corridor Co-location
Sigurd-Red Butte
Southern Nevada Water Authority
ON Line
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 5-6
Region III
Cumulative Impacts (Detail)
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Western AREA POWER ADMINISTRATION
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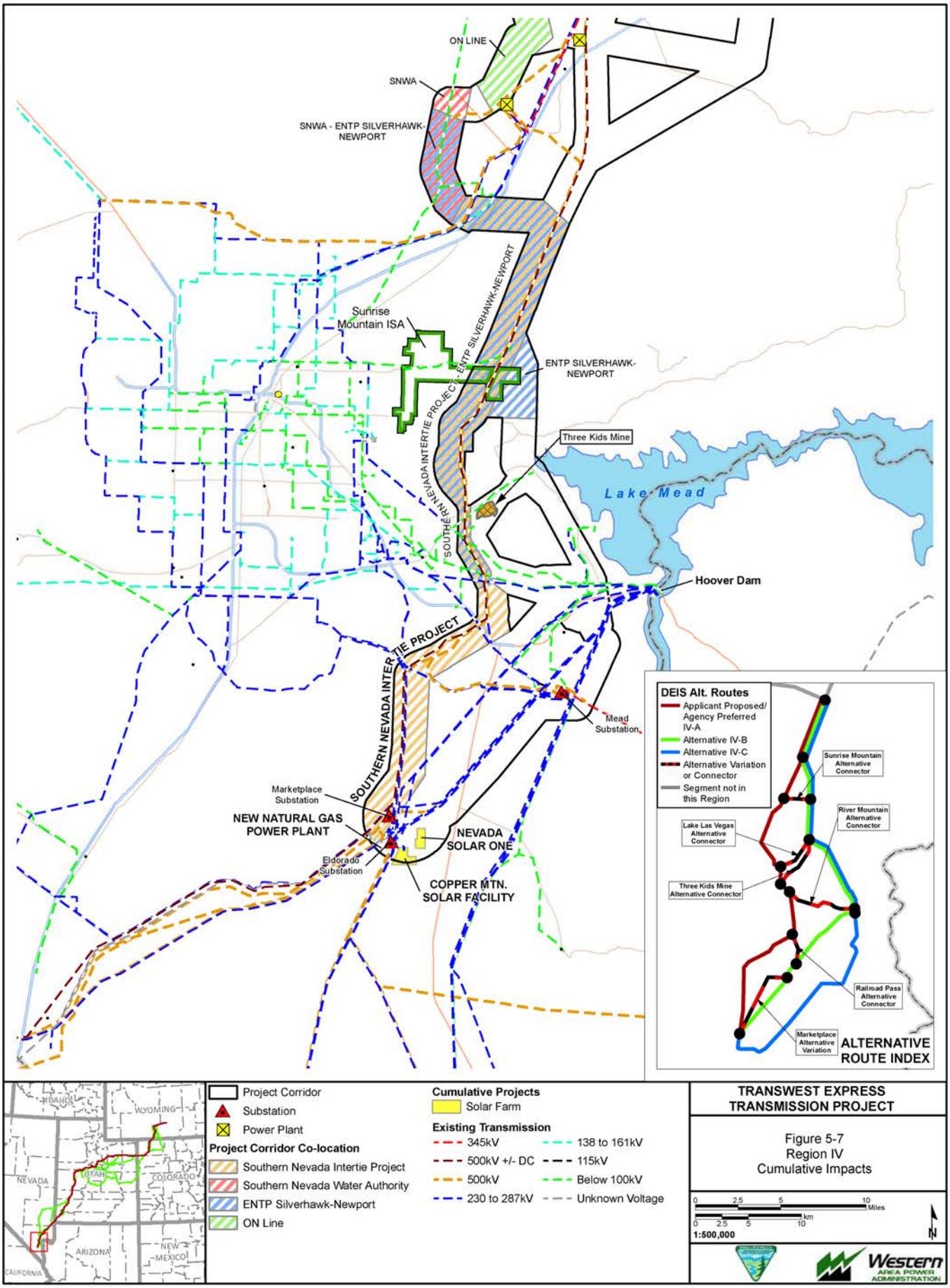

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Table 5-10 Estimated Cumulative Impacts from Past and Present Actions in the Region IV Analysis Area

Vegetation/Habitat Cover Type	Region IV Currently Disturbed (acres)	Region IV Historic Vegetation/Habitat	Percent Disturbed from Past and Present Actions
Barren/Sparsely Vegetated	8,445	793,928	1
Conifer Forest		-	-
Desert Shrubland	26,725	213,968	12
Grassland	-	-	-
Montane Shrubland	-	-	-
Open Water	293	114,412	<1
Pinyon-Juniper	-	12,329	-
Sagebrush Shrubland	-	-	-
Total	**35,463**	**1,134,637**	**3**

5.2.4.2 Reasonably Foreseeable Actions

Figure 5-7 illustrates the geographic relationships of the TWE Project alternatives and other reasonably foreseeable projects in Region IV. **Table 5-11** provides a summary of the types of projects, estimated construction time frames, and their potential cumulative impacts relationships.

Table 5-11 Reasonably Foreseeable Future Actions in Region IV

Type of Project	Construction Time Frame	Project/Description
Transmission Line	2012- 2013	Silver State Energy Associates Eastern Nevada Project 230-kV AC. Proposed from Silverhawk Power Plant to Newport Substation south of Henderson.
Transmission Line	2012-2014	Great Basin Transmission/ NV Energy Southern Nevada Interconnection Project
Centennial West Transmission Line	Unknown	Centennial West Clean Line 500-kV DC. New Mexico to California One alternative would interconnect at Marketplace Substation in the Eldorado Valley.
Fiber Optic Line	Unknown	Nevada Hospital Association, Nevada Broadband Telemedicine Initiative proposal to install fiber optic cable on existing Nevada Energy poles.
Renewable Energy	Unknown	Several of Nevada's Solar Energy Zones (SEZ) impact the same resources as the Project. These include the Dry Lake SEZ, Dry Lake North SEZ, Delamar Valley SEZ, and East Mormon Mountain SEZ. These areas are prioritized for the development of solar energy.

A summary of the disturbance impacts to the Region IV Analysis area from the RFFAs described above is given in **Table 5-12**.

Table 5-12 Estimated Cumulative Impacts from RFFAs in the Region IV Analysis Area

Vegetation Cover Type	RFFA Disturbance	Total Vegetation in Region IV Analysis Area (acres)	Percent Cumulative Disturbance from RFFA	Percent Additional Disturbance from TWE Alternatives
Agriculture	-	-	-	-
Aspen Forest and Woodland	-	-	-	-
Barren/Sparsely Vegetated	-	32,592	<1	<1
Cliff and Canyon	-	57,076	-	-
Conifer Forest	-	-	-	-
Deciduous Forest	-	-	-	--
Desert Shrub	6,140	720,701	1	<1
Developed/Disturbed	-	239,577	-	-
Dunes	-	-	-	-
Grassland	-	7,121	-	-
Greasewood Flat	-	-	-	-
Herbaceous Wetland	-	719	-	-
Montane Grassland	-	-	-	-
Montane Shrubland	-	-	-	-
Open Water	-	69,401	-	-
Pinyon-Juniper	-	1,888	-	-
Riparian	-	2,576	-	-
Sagebrush Shrubland	-	671	-	-
Saltbush Shrubland	-	1,912	<1	<1
Tundra	-	0	-	-
Woody Riparian and Wetlands	-	1,096	-	-
Total	**6,140**	**1,135,330**	**<1**	**<1**

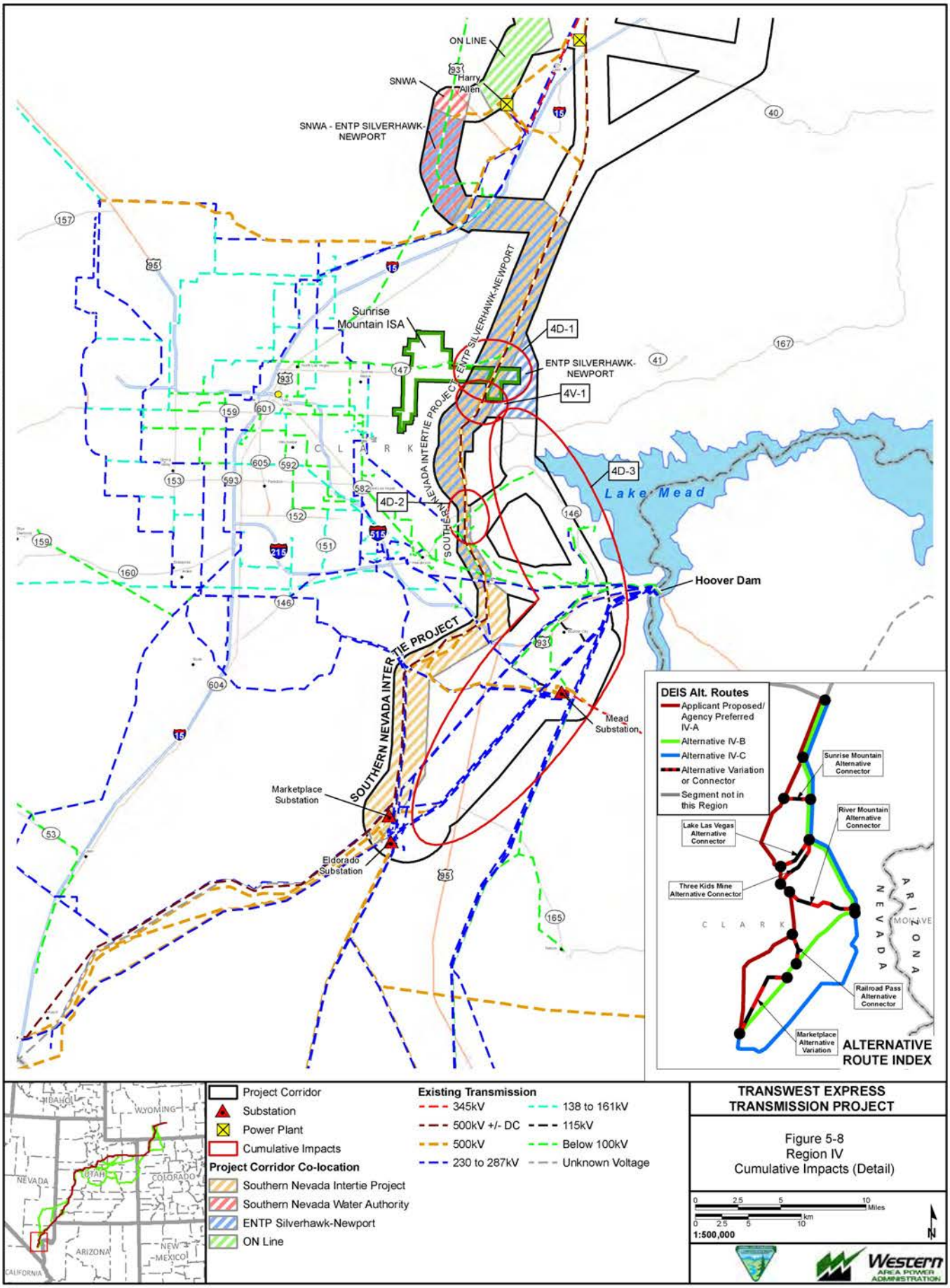
Figure 5-8 identifies potential cumulative impact constraint areas in Region IV, which are identified and discussed in greater detail, by applicable resource, in Sections 5.3.1 through 5.3.19.

5.2.5 Cumulative Impacts to Project Corridors

Many of the Project alternative corridors have the potential to be shared by reasonably-foreseeable transmission lines that propose similar or identical routes. This possibility for shared corridors was one of the criteria used by the BLM field offices for determining what plan amendments may need to be proposed and analyzed in this EIS. For specific resources where that co-location would result in unique cumulative impacts, those potential areas and/or extent of co-location are discussed below.

5.3 Cumulative Impacts

The following sections discuss the cumulative impacts study area and time frames for each resource; cumulative impacts common to all alternatives, and discussions of cumulative impact issues within regions by alternative.



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5.3.1 Air Quality

5.3.1.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – for regulated criteria pollutants – local air sheds (largely defined by surrounding high terrain); for greenhouse gas emissions – global.
- Temporal – Total project construction period (3 years) for construction activities; life of Project indefinite but assumed to be a minimum of 50 years for effects on greenhouse gases.

5.3.1.2 Cumulative Impacts

Criteria Pollutants

Existing regional air quality is in general compliance with NAAQS with the exception of the Las Vegas Valley, where air quality is considered to be nonattainment for ozone (8-hour) and PM_{10} (24-hour). The Project analysis found that, with implementation of fugitive dust and equipment emissions controls, there would be no predicted violation of ambient air quality standards by Project activities. Project construction activities would extend across a long, linear area over short periods of time (months). Because of differences in construction timing, it is unlikely that the Project emissions would overlap with those of other transmission projects undertaken in the same utility corridor.

Air quality monitoring data show that air quality in northwestern Colorado and northeastern Utah is considered to be in compliance with state and Federal ambient air quality standards. Cumulatively, current and reasonably foreseeable oil and gas development in this area (Regions I and II) creates the greatest potential risk to air quality in the Project analysis area. Cumulative air quality impacts from existing and foreseeable oil and gas development in Region I are unlikely to result in regional violations of NAAQS (see Section 5.1 of the Chokecherry Sierra Madre Wind Farm Final EIS; BLM 2012). Cumulative impacts of oil and gas development to air quality in the Uintah Basin are summarized below in **Table 5-13**.

Table 5-13 Cumulative Impacts of Oil and Gas Development to Air Quality in the Uintah Basin (Region I)

Pollutant	Averaging Time	Background and Existing Source Impacts (µg/m3)	Cumulative Sources Maximum Predicted Impact plus Background (µg/m3)	NAAQS (µg/m3)
NO_X	1-hour	20.0	157.2	188
	Annual	9.0	16.7	100
CO	1-hour	5,325	6,724	40,000
	Annual	3,910	4,161	10,000
SO_2	1-hour	21.7	24.3	197
	3-hour	16.7	18.6	1,300
	24-hour	5.9	6.8	365
	Annual	1.5	1.6	80
PM10	24-hour	18.0	22.5	150
PM2.5	24-hour	21.6	26.1	35
	Annual	12.3	13.1	15

Source: Greater Natural Buttes Final EIS (BLM 2012b).

However, based on recent monitoring, it is reasonably foreseeable the continued development in the area would result in future exceedances of NAAQS for certain criteria pollutants. Year-round ozone monitoring in the Uinta Basin have recorded numerous exceedances of the 8-hour ozone standard during the winter months (January through March). The most likely source of ozone precursors in the Uinta Basin are oil and gas operations in the vicinity of the monitors. Additionally, The Utah Division of Air Quality (UDAQ) conducted limited monitoring of $PM_{2.5}$ in Vernal, Utah, in December 2006. During the 2006-2007 winter seasons, $PM_{2.5}$ levels were measured at the Vernal monitoring station that were higher than the $PM_{2.5}$ health standard that became effective in December 2006. The most likely causes of elevated $PM_{2.5}$ at the Vernal monitoring station are probably those common to other areas of the western U.S. (combustion and dust) plus nitrates and organics from oil and gas activities in the Basin.

Air quality monitoring data show that air quality in the Region III analysis area is considered to be in compliance with state and Federal ambient air quality standards. Portions of the Region IV analysis are located in Clark County, where the air quality is considered to be nonattainment for ozone (8-hour) and PM_{10} (24-hour). The Project would not contribute to existing projects to the extent that it would cause exceedances of either ozone or PM_{10} (**Table 3.1-18**).

Conclusion

Contributions of the Project alternatives to cumulative emissions from existing and reasonably foreseeable future projects would not lead to exceedance of NAAQS for criteria pollutants.

Greenhouse Gas Emissions and Climate Change

Total greenhouse emissions from the proposed project and alternatives would range from 749 to 833 tons per year during construction. Total construction GHG emissions would be less than 3 percent of what would be considered a major source by USEPA. Although this project's construction would have negligible inputs on the global carbon emissions, it would still be contributing cumulatively in the short term to total global annual GHG emissions, which total an estimated 41 billion metric tons (Emissions Database for Global Atmospheric Research 2012). GHG emissions have been linked with accelerated climate change (National Research Council 2010; IPCC 2007).

Conclusion

Project alternatives short-term negligible contribution to cumulative GHG would be offset in the long-term by the Project's facilitation of the use of renewable energy resources, which would contribute much less long-term operational GHG emissions than conventional non-renewable energy sources such as coal or gas-fired power plants. Assuming the transmission line carries 80 percent renewable energy, there would be a net saving of 3000 megawatts of generation resulting in a savings of about 16,000 GWh of power production from fossil fuels on an annual basis. The USEPA Greenhouse Gas Equivalencies Calculator indicates that this would reduce CO_2e emissions by 12.2 $X10^6$ tons per year. Accordingly, in the long term, the Project and alternatives actually would decrease potential contributes to cumulative GHG emissions and global climate change.

5.3.2 Geologic Hazards, Paleontology, and Mineral Resources

5.3.2.1 Physical and Temporal Boundaries of Cumulative Impacts

Geologic Hazards – Landslides

- Physical – boundaries of recent landslide features based on geologic and geotechnical studies.
- Temporal – Indefinite (minimum of 50 years).

Paleontological Resources

- Physical – Extent of high yield fossil deposits within areas of Project surface disturbance.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years) for improved access for unauthorized fossil collections.

Mineral Resources – Oil and Gas Wells and Infrastructure

- Physical – Area of oil and gas fields with economically recoverable reserves.
- Temporal – Indefinite (minimum of 50 years).

Mineral Resources – Surface and Underground Coal or Other Mineral Mines

- Physical – Area of economically recoverable coal or mineral reserves.
- Temporal – Indefinite (minimum of 50 years).

5.3.2.2 Cumulative Impacts

Geologic Hazards. Engineering design to address geologic hazards would be specific to each project. In general, separation requirements between transmission lines (generally 1,500 feet or more) would be adequate to prevent cumulative impacts (one transmission line falling into another) as the result of earthquake ground shaking and soil liquefaction. Construction of access roads and structure foundations for one transmission project could affect slope stability for nearby projects located upslope or down slope. In many locations, resource concerns create the potential for project pinch points where reasonably foreseeable transmission lines may be approved only if they are built closer than 1,500 feet to each other. In some of these cases, it is possible that agencies will require them within 250 feet from each other in the same corridor. In these cases, there is a risk of transmission lines falling into each other if there is a major seismic event. It is not certain where this may occur and would depend on which alternative corridor and what degree of separation the lead federal management agencies would require. Potential pinch point areas include Segments 100, 101.10, 101.20, and 101.30 (all alternatives in Region I); Segments 218, 219.10, 219.50, 219.6, and 217.052 (Alternatives II-E and II-F); Segment 520 (Alternative III-C); and Segments 610, 620, 630, 640, 650, 660, 700, 720, 740 (Alternatives IV-A, IV-B, and IV-C). Also, it is possible that if the USFS approves multiple transmission lines across IRAs, they also may require a closer separation distance than 1,500 feet.

Areas of known landslides have been identified (Section 3.2). Specific areas where access road planning and geotechnical studies may be needed to address landslide hazards for multiple projects within the utility corridor are listed by region and alternative:

- Region II: Alternatives II-A, II-E, and II-F in Utah: Price River valley (U.S. Highway 6) to Nephi. Potential cumulative facilities: Two new parallel transmission lines (TWE, EGS), existing 500-kV transmission line (**Figure 5-4 – Area 2G-1**).
- Region II: Alternative II-B in Utah: Fountain Green to Nephi. Potential cumulative facilities: Two new parallel transmission lines (TWE, EGS), existing 345-kV transmission line (**Figure 5-4 – Area 2G-2**).

Paleontological Resources. Surface disturbance within high yield fossil areas likely would result in some irreversible loss of fossil material, regardless of the monitoring and fossil recovery programs implemented. It is anticipated that each project that would be constructed across high yield fossil areas would incrementally reduce the quantity of near-surface fossil resources as more of the ground surface is disturbed. The quantities of fossils recovered and contributed to scientific collections also would incrementally increase.

The risk of unauthorized collection of fossils would be increased by improved access and more bedrock exposure from construction activities.

Mineral Resources – Oil and Gas Wells. The Project has used a 250-foot offset from existing well pads as a planning criterion for routing the transmission line through active oil and gas fields. Similar offset requirements would be anticipated for other transmission projects traversing the same fields. Since well pad development is typically not regular (well pad site locations are optimized for favorable terrain, access, and interconnection options), the second transmission line must find an independent alignment to avoid existing and planned well pads. The consequence of this requirement is that the second transmission line project cannot maintain a standard distance from the first transmission line, usually resulting in greater separation distances. The well pad offset buffer may change the development pattern of the well field by requiring more directional drilling. In summary, it is unlikely that one or more transmission lines would preclude access to underlying oil and gas resources, but may increase the costs of drilling and production, as well as the transmission line costs because of additional length, and ultimately, a wider utility corridor. Areas where detailed transmission line routing would be required, with potential utility corridor width expansion within active oil and gas fields are listed below:

- Region I: Alternatives I-A, I-B, and I-C: I-80 Corridor, Sinclair to vicinity of Monell. Potential facilities: Three new parallel transmission lines (TWE, EGW, EGS); existing 230-kV transmission line (**Figure 5-2 – Area 1G-1**).
- Region I: Alternatives I-A, I-B, and I-C in Wyoming: I-80 Corridor to Wyoming/Colorado border. Potential facilities: Two new parallel transmission lines (TWE, EGS) (**Figure 5-2 – Area 1G-2**).
- Region II: Alternatives II-B and II-C in Colorado: Rangely to I-70 corridor. Potential facilities: Two new parallel transmission lines (TWE, EGS); existing natural gas liquids pipeline, Baxter Pass road (**Figure 5-4 – Area 2G-3**).

Minerals – Underground Coal Mines. Project alternative corridors would cross the surface of underground coal leases. These areas could experience subsidence from long wall mining in the future. Any other transmission project that crosses the same underground coal leases would likely experience the same subsidence risks. Cumulatively, these transmission lines could restrict access to some of the coal resources underneath the transmission lines, depending on how those resources are mined.

- Region II: Alternative II-B in Utah: Wasatch Plateau, west of Huntington Power Plant. Potential facilities: Two new parallel transmission lines (TWE, EGS); existing 345-kV transmission line (**Figure 5-4 – Area 2G-4**).

Conclusion

Cumulative construction of multiple transmission lines in the same corridor increases the risk to paleontological resources. However, the required mitigation measures associated with potential impacts to paleontological resources required in BLM RMPs would largely preclude those impacts from being significant. Oil and gas development would not experience significant cumulative effects from multiple transmission lines due to the ability to directionally drill to access subsurface resources. Underground coal operations would not be affected by overhead transmission lines; however, those lines could be at risk of subsidence and would need to be planned accordingly. Cumulative addition of multiple transmission lines in coal leases could impact the ability to surface mine those areas in the future.

5.3.3 Soils

5.3.3.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – HUC 10 watersheds impacted by the proposed project.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.3.2 Cumulative Impacts

The majority of the soils crossed by the Project alternatives underlie native rangelands. Many of these soils are erodible by wind and water, and vegetation cover is sparse because of aridity. Existing actions that affect soil stability and quality include livestock grazing, agricultural production on irrigated lands, ROWs for roads, pipelines, oil and gas developments, and vegetation treatments. The most prevalent indicator of cumulative soil loss throughout the analysis area is proportional disturbance to the soils surface. A summary of the total estimated proportional disturbance to soils throughout the HUC 10 watersheds in the analysis area is shown in **Table 5-14**.

Table 5-14 Estimated Cumulative Disturbance to Soils in Analysis Area

Region	Total Acreage of Existing Soils in Analysis Area	Total Acreage of Surface Disturbance from Past and Present Actions	Total Disturbance from RFFAs	Percentage of Analysis Area Disturbed
I	5,350,458	261,550	53,889	5
II	11,120,289	786,455	65,148	8
III	7,318,681	197,809	19,291	3
IV	1,135,330	35,464	6,140	3
Total	**24,924,758**	**1,281,278**	**144,468**	**6**

Conclusion

Both the BLM and the USFS require soil protection BMPs that would be applicable for all reasonably foreseeable project disturbances that are likely to occur in the analysis area (**Appendix C**). However, cumulative surface disturbance ranging from 3 to 8 percent at the region watershed level, with an average of 6 percent throughout the analysis area, would result in continued soil erosion and loss of soil productivity throughout the project area. Additional disturbance from the Project alternatives would proportionally contribute very little cumulatively to these impacts (<1 percent).

5.3.4 Water Resources

5.3.4.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Project surface disturbance to HUC10 impaired watersheds impacted by the Project.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.4.2 Cumulative Impacts

As with soil resources, a reliable indicator of potential cumulative impacts to water quality throughout the analysis area is proportional surface disturbance and loss of vegetation cover, particularly in existing impaired watersheds. A summary of the total estimated cumulative loss of vegetation for impaired HUC 10 watersheds in the analysis area is shown below in **Table 5-15**.

Table 5-15 Estimated Cumulative Impacts from RFFA on Impaired Watersheds

Impaired Watershed	Total Impaired Watershed Acreage (acres)	Cumulative Disturbance from Past, and Present Actions	Cumulative Disturbance from RFFA (acres)	Percent of Analysis Area Disturbed
Antelope Creek	127,072	5,097	1,277	5
Upper Muddy Creek	135,362	2,705	3,248	4
Cottonwood Creek	216,237	17,577	14,745	15
Soldier Creek	150,876	5,347	9,054	10
Deception Creek	136,566	12,162	-	9
Spring Creek – Yampa River	212,195	13,992	-	7
Hell's Canyon	242,708	4,742	-	2
Greasewood Gulch – Little Snake River	229,499	5,788	-	3
Outlet Douglas Creek	98,453	2,521	-	3
Evacuation Creek	184,097	2,370	-	1
Pigeon Water Creek – Lake Fork River	123,304	38,350	-	31
Coal Creek	161,019	27,217	-	17
Total	**2,017,388**	**137,868**	**28,324**	**8**

Conclusion

Disturbance

The impaired watersheds show a wide range of cumulative disturbance from past and present actions (1 to 31 percent). When combined with RFFAs, total disturbance in the impaired watersheds ranges from 5 to 31 percent. The high level of past and present cumulative disturbance in these watersheds presents an existing condition where erosion, sedimentation, and subsequent water quality impacts would continue to occur. The Project would contribute minimally to the disturbance in these watersheds (less than 1 percent).

Both the BLM and the USFS require soil protection BMPs that would be applicable for all reasonably foreseeable project disturbances that are likely to occur on federal lands in the analysis area (**Appendix C**). Additionally, both the BLM and USFS have best management practices and stipulations to address the avoidance and or minimization of impacts to perennial water bodies. These practices are described in detail in **Appendix C**, and the impacts of implementing these practices are summarized in the Section 3.4, Water Resources. Adherence to these BMPs would decrease the long-term contribution of the Project to the cumulative disturbances in these watersheds.

Water Use

TransWest proposes to obtain batch plant and dust control water from municipal or commercial sources, or from existing water rights. The use of existing water rights would avoid water reduction effects on other users, and would not change the surface water diversion pattern already in place. Assuming that other foreseeable transmission line projects in the same utility corridor would apply the same approach to construction water acquisition, no additive cumulative reductions in stream flows are anticipated.

5.3.5 Vegetation

5.3.5.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Disturbance to vegetation within HUC 10 watersheds impacted by the Project.
- Temporal
  - Construction – Approximately 1 year at any location before re-vegetation can be initiated.
  - Operation – Indefinite (minimum of 50 years).

5.3.5.2 Cumulative Impacts

Native vegetation communities predominate within the Project alternative corridors in all regions (Section 3.5, Vegetation). The majority of these communities are shrublands, with long recovery times after disturbance. Summaries of the cumulative vegetation impacts to the HUC 10 analysis from past, present, and reasonably foreseeable future actions, as well as the proportional additional impact from the Project alternatives, are found in **Tables 5-1**, **5-3**, **5-4**, **5-6**, **5-7**, **5-9**, **5-10**, and **5-12**.

Conclusion

Cumulative impacts on RFFAs on vegetation affected by the Project would be relatively low (averaging less than 1 percent disturbance of the analysis area). Past and present disturbance to vegetation is considerably higher, ranging from 3 to 8 percent of the analysis area. All Project alternatives would contribute less than 1 percent of long-term disturbance to this cumulative disturbance. This small proportional amount of cumulative disturbance would have a low impact on overall vegetation composition and health in the analysis area.

5.3.6 Special Status Plants

5.3.6.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – boundary of special status plant species habitat potentially impacted with the Project alternatives' 2-mile corridor.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.6.2 Cumulative Impacts

Suitable habitat has been identified for a variety of federal listed and candidate plant species, as well as BLM and USFS sensitive species for corridors where the Project and other reasonably foreseeable transmission could be constructed. Section 3.6, Special Status Plant Species discloses the acreage of sensitive plant species suitable habitat within the Project 2-mile corridors. It is reasonably foreseeable that there could be up to three transmission lines with 1,500 feet of separation in any one of these Project corridors that include sensitive plant habitat. In that case, total avoidance of that habitat or individual plant species would become very difficult and the acreage of sensitive species habitat disclosed for each region in Section 3.6, Special Status Plant Species, of this Draft EIS would be at risk of disturbance from cumulative disturbance from road construction, ROW clearing, and tower placement activities.

TransWest will conduct surveys for special status plants for any special status plant species habitat that it cannot avoid as outlined in mitigation measure **SS-1**. The results of these surveys would be used to route surface disturbance around plant individuals and populations. Based on mitigation measure **SSP-3**, surface disturbance would be located 300 meters from any special status plant species populations or individuals. It is highly likely that BLM and USFS plan requirements would require that other foreseeable projects within the Project alternative corridors conduct similar surveys. To the extent possible, sensitive plant species

individuals would be avoided on federal lands subject to ROW grant stipulations, including those stipulations required by the respective BLM field offices and USFS forests crossed by the Project (see **Appendix C**). However, in certain areas, the approval of two or more transmission lines in the same corridor would make total avoidance of special status plant habitat virtually impossible. As a result, the following species could be cumulatively impacted through the loss of suitable habitat and/or individuals: Maguire campion, clay phacelia, Ward beardtongue, Uinta Basin hookless cactus, clay reed-mustard, shrubby reed-mustard, Graham's penstemon, Duchesne greenthread, Goodrich blazingstar, Untermann daisy, Deseret milkvetch, Arizona willow, Elsinore buckwhat, and Sigurd townsendia. The location and extent of these species' habitats that would be subject to this risk are disclosed in detail in Section 3.6, Special Status Plant Species.

Conclusion

Cumulative disturbance to special status plant populations from multiple transmission lines in project corridors would be minimized through surveys and design and engineering to avoid individuals and populations. BMPs, including erosion controls, timber mats, helicopter-only tower installation (where appropriate), and limited surface travel would likely be required for all foreseeable transmission lines to minimize and prevent indirect impacts to these species. However, for those areas where avoidance is difficult, loss of some sensitive plants is inevitable. The exact location and extent of this loss cannot be ascertained until the lead agencies determine the number and location of transmission lines that would eventually be permitted in the same corridors.

5.3.7 Wildlife

5.3.7.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Big game – agency-designated habitat impacted by the proposed project; small game and waterfowl – habitat vegetation types with the HUC 10 watershed impacted by the proposed project.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.7.2 Cumulative Impacts

A variety of representative wildlife species have been identified as potentially present within the Project analysis area. The cumulative impacts to these species are summarized in **Tables 5-16** and **5-17**.

Table 5-16 Estimated Cumulative Impacts from RFFA on Big Game Habitat

Big Game Habitat	Cumulative Disturbance from RFFA (acres)	Total Big Game Habitat (acres)	Percent Disturbed from RFFA
Colorado Mule Deer – severe winter	1	856,837	<1
Colorado Pronghorn –severe winter	66	214,084	<1
Colorado Rocky Mtn. Elk – severe winter	-	1,122,742	-
Nevada – Desert Bighorn Sheep	404	822,392	<1
Nevada – Mule Deer	-	250,417	-
Nevada - Pronghorn	3,430	1,512,355	<1
Utah – Desert Bighorn Sheep	-	1,171,482	-
Utah - Moose	28,530	1,319,143	2
Utah – Mule Deer winter crucial	6,525	4,299,439	<1
Utah – Pronghorn year-long crucial	13,983	10,574,061	<1

Table 5-16 Estimated Cumulative Impacts from RFFA on Big Game Habitat

Big Game Habitat	Cumulative Disturbance from RFFA (acres)	Total Big Game Habitat (acres)	Percent Disturbed from RFFA
Utah – Pronghorn year-long substantial	449	935,283	<1
Utah – Rocky Mtn. Bighorn year-long crucial	4,647	1,781,886	<1
Utah – Rocky Mtn. Elk winter crucial	5,192	3,329,852	<1
Wyoming – Mule deer crucial winter	174	56,618	<1
Wyoming – Mule Deer crucial winter/yearlong	4,346	306,210	1
Wyoming – Pronghorn crucial winter/yearlong	5,975	485,710	1
Wyoming – Rocky Mtn. Elk crucial winter/yearlong	2,056	206,076	1
Total	**75,778**	**29,244,587**	**<1**

Table 5-17 Estimated Cumulative Impacts from RFFA on Small Game and Waterfowl Habitat

Habitat	Cumulative Disturbance from RFFA (acres)	Total Habitat (acres)	Percent Disturbed from RFFA
Small Game	143,771	23,782,225	1
Waterfowl	507	625,201	<1
Total	**144,278**	**24,407,426**	**1**

Conclusion

Cumulative impacts to big game, small game, and waterfowl species habitat are low (typically less than 1 percent) throughout the analysis area. This relatively low amount of cumulative impact is unlikely to impact the overall population viability of these species in the analysis area. However, the co-location of two or more transmission lines with 1,500 feet of separation in a given wildlife corridor may affect the ability of wildlife to cross the corridor. The level of impact depends upon the number of transmission lines allowed and the extent of clearing required in that segment. The extent of this impact depends upon the location and number of transmission lines approved.

5.3.8 Special Status Wildlife Species

5.3.8.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Federal listed, federal candidate, USFS Sensitive, and USFS MIS species – federal or state designated habitat impacted by the proposed project and/or potential habitat within HUC 10 watersheds impacted by the proposed project.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.8.2 Cumulative Impacts

Cumulative impacts for representative special status wildlife species were analyzed based on potential habitat identified through vegetation cover type, modeled habitat, or specific federal or state designated habitat. With the exception of desert tortoise and sage grouse, cumulative impacts to special status species are shown in **Table 5-18**. Desert tortoise and sage grouse cumulative impacts are presented separately in

Tables 5-19 and **5-20**, respectively. These latter two species are presented separately because they are analyzed by modeled or designated habitat that varies by state or model type.

Table 5-18 Estimated Cumulative Impacts from RFFA on Special Status Species Habitat

Habitat	Cumulative Disturbance from RFFA (acres)	Total Habitat (acres)	Percent Disturbed from RFFA
Federal Listed Species			
Black-Footed Ferret	3,459	729,682	<1
California Condor	7,819	2,420,898	<1
Canada Lynx	19,428	513,005	4
Gray Wolf	137,729	23,782,226	1
Mexican Spotted Owl	807	729,612	<1
Pygmy Rabbit	63,299	6,539,728	1
Northern Goshawk	23,404	1,181,087	2
Utah Prairie Dog	3,994	801,113	<1
Southwestern Willow Flycatcher	59	166,286	<1
Yellow-Billed Cuckoo	59	166,286	<1
Yuma Clapper Rail	27	82,460	<1
USFS MIS			
Yellow Warbler	35,081	7,928,961	<1
White-Tailed Ptarmigan	-	-	-
Warbling Vireo	12,181	4,937,166	<1
Song Sparrow	104,987	19,234,661	1
Lincoln's Sparrow	35,472	8,117,201	<1
Hairy Woodpecker	16,242	5,735,533	<1
Western Bluebird	58,840	10,875,161	1
MacGillivray's Warbler	35,104	7,942,895	<1
Brewer's Sparrow	63,299	6,539,728	1
Abert's Squirrel	19,454	553,538	4
American Beaver	1,031	368,534	<1
Wild Turkey	54,918	14,825,276	<1
Northern Flicker	12,989	6,463,377	<1
Three-toed Woodpecker	23,404	1,181,087	2
Total	**733,086**	**131,815,501**	**<1**

Table 5-19 Estimated Cumulative Impacts from RFFA on Desert Tortoise Habitat

Desert Tortoise Habitat	Cumulative Disturbance from RFFA (acres)	Total Desert Tortoise Habitat (acres)	Percent Disturbed from RFFA
USFWS Critical Habitat	2,095	958,353	<1
USFWS Potential Habitat (USGS Modeled 0.3)	10,982	2,812,620	<1
USGS Modeled Habitat (0.6 – 1.0)	10,907	2,679,923	<1
Total	**23,984**	**6,450,896**	**<1**

Table 5-20 Estimated Cumulative Impacts from RFFA on Sage Grouse Habitat in Colorado and Utah

Sage Grouse Habitat	Cumulative Disturbance from RFFA (acres)	Total Sage Grouse Habitat (acres)	Percent Disturbed from RFFA
Wyoming Core Habitat	4,599	712,257	<1
Colorado - PGH	507	800,993	<1
Colorado - PPH	374	1,261,030	<1
Utah – brood rearing	5,392	1,387,960	<1
Utah - occupied	6,635	1,708,028	<1
Utah - winter	1,519	992,175	<1
Total	**19,026**	**6,862,443**	**<1**

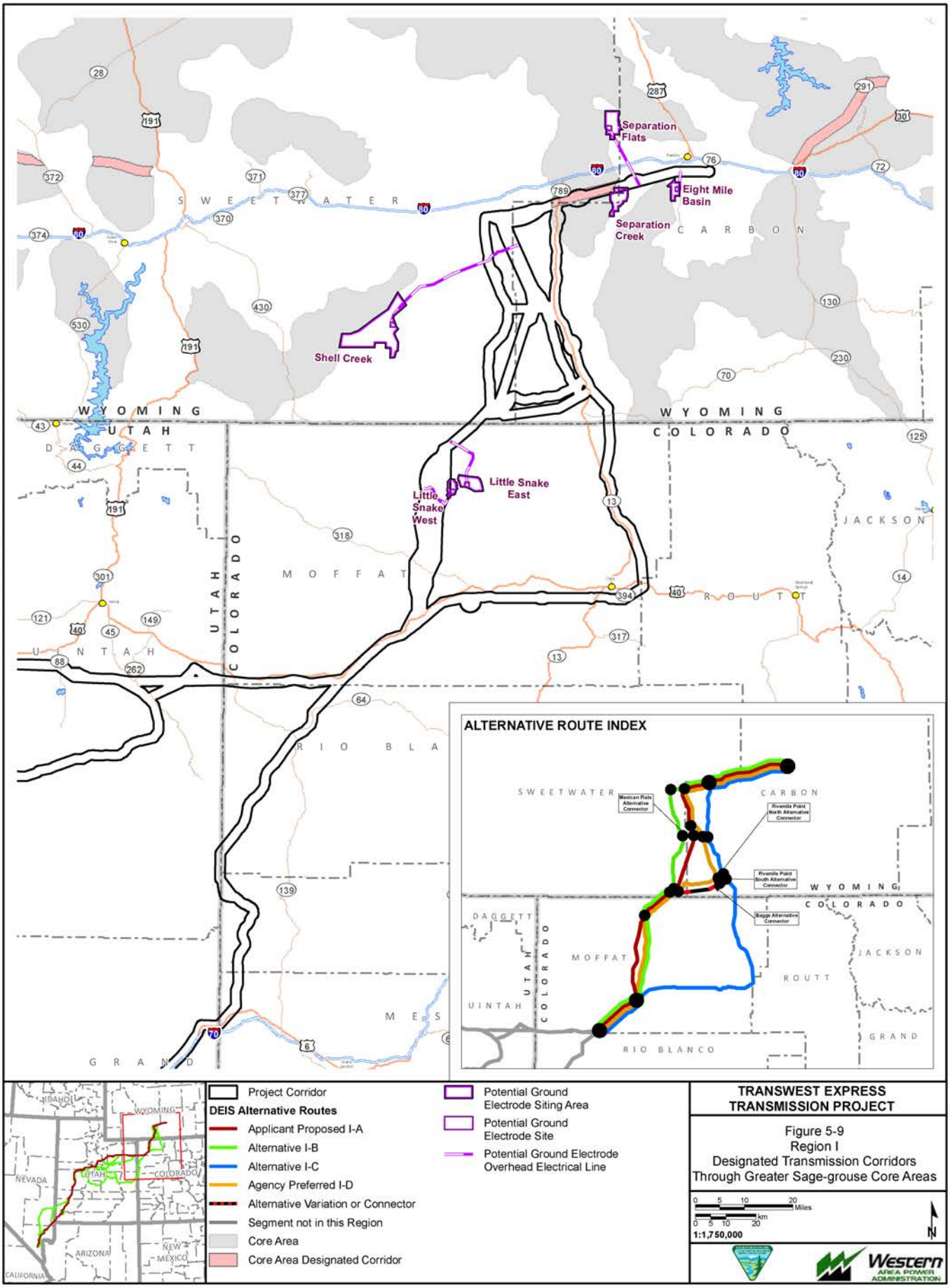
Cumulative impacts to greater sage grouse are disclosed by state to account for differences in how the BLM and/or state wildlife agencies in each state categorize greater sage grouse habitat. These impacts are summarized in **Table 5-20**.

There are a large number of BLM sensitive species that would be cumulatively impacted by RFFAs and the Project. Cumulative impacts to these species are represented by the vegetation impacts for the habitat types they are associated with (see **Tables 5-1**, **5-3**, **5-4**, **5-6**, **5-7**, **5-9**, **5-10**, and **5-12**). A description of which habitat types are associated with which species is provided in Section 3.8, Special Status Wildlife Species, **Tables 3.8-25**, **3.8-36**, **3.8-43**, and **3.8-51**.

Conclusion

Cumulative impacts to the majority of the federally listed or candidate species from reasonably foreseeable future actions and the Proposed Action and alternatives are relatively low (less than 1 percent of available habitat) and are unlikely to contribute to a loss in population viability for the species. Note that federally listed species that rely on conifer habitat (i.e., Northern goshawk, Canada lynx, Abert's squirrel) would experience cumulative habitat loss of from 2 to 4 percent. Again, this relatively small amount of habitat loss is unlikely to lead to a loss of population viability for these species; however, it could represent a cumulative risk to populations of that species if that habitat is not restored or replaced over time. The relative contribution of all the Project alternatives to direct long-term impacts to these special status species would be less than 1 percent.

Based on requirements outlined in Wyoming Executive Order 2011-5, an evaluation of cumulative effects to greater sage grouse habitat is required where projects would traverse core area habitats in Wyoming (**Figure 5-9**). This evaluation requires consideration of surface disturbance from existing projects, as well as the Project. As stated in Wyoming Executive Order 2011-5, surface disturbance within core areas is limited to no more than 5 percent of suitable greater sage-grouse habitat per an average of 640 acres and 1 structure per 640 acres. Based on the *Density and Disturbance Calculation Tool* (DDCT) *Manual* (dated 7-13-11), greater sage-grouse habitat disturbance and density calculations were performed for alternative corridors affecting Wyoming core sage grouse habitat. The methodology for this evaluation is contained in the DDCT Manual. The results of those calculations indicated that for all Project alternatives in area habitat, impacts when considered with present disturbance would have a total cumulative proportional impact on core habitat ranging from approximately 2 to 3 percent and none of the alternatives would result in more than 1 structure per 640 acres.


Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake East
Little Snake West
SWEETWATER
CARBON
WYOMING
UTAH
COLORADO
DAGGETT
MOFFAT
JACKSON
ROUTT
UINTAH
RIO BLANCO
GRAND
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Riverside Point North Alternative Connector
Riverside Point South Alternative Connector
Bagge Alternative Connector
IDAHO
NEVADA
ARIZONA
NEW MEXICO
CALIFORNIA
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Core Area
Core Area Designated Corridor
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 5-9
Region I
Designated Transmission Corridors
Through Greater Sage-grouse Core Areas
Miles
km
1:1,750,000
N
Western AREA POWER ADMINISTRATION
Exported On: 6/5/2013
X:\0Projects\12907_003_Transwest_Express\Figures\DocumentFigures\2013_DEIS_v3\CumulativeFig_5_09_SRI_GSG_CoreTlineCorridors.mxd

Direct long-term cumulative loss of sage grouse habitat from reasonably-foreseeable future actions and the Proposed Action are relatively low (less than 1 percent of available habitat) and are unlikely to contribute to a loss in population viability for the species. However, past impacts to sage grouse habitat, ranging from 5 to 17 percent in the analysis area, have undoubtedly decreased existing populations. The cumulative impacts of this Project and other RFFAs would continue to contribute cumulatively to these decreases unless effectively mitigated. Additionally, short-term construction noise from multiple transmission lines within alternative corridors, as well as increased long-term perching opportunities for potential raptor predators, would affect up to 20 percent of available sage grouse habitat within the analysis area. While this indirect impact would not remove that habitat, it would have short-term disturbance effects that could decrease occupancy of the area. It is possible that increased perching opportunities may increase predation risk on sage grouse using cumulatively impacted habitat. The requirement for anti-perching devices on proposed transmission structures may decrease this risk.

It is recommended that TransWest conduct pre-construction surveys, avoid habitat removal, and conduct monitoring surveys to reduce habitat loss and loss of individuals from construction activities. Similar measures likely would be required for other foreseeable projects requesting a federal ROW permit. Typically, avoidance of special status species habitat to the extent possible is required for all proposed projects crossing USFS and BLM land. For those instances where absolute avoidance is not possible, plan stipulations are designed to minimize project impacts on these species (**Appendix C**).

5.3.9 Aquatic Biological Resources

5.3.9.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – stream crossing locations within the transmission line construction ROW, and access road system.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.9.2 Cumulative Impacts

The risk of cumulative impacts to aquatic organisms can be assessed based on the total vegetation clearing and associated sedimentation risk disclosed in Section 5.3.4, Water Resources. Additionally, cumulative direct disturbance impacts could occur to a variety of aquatic invertebrate, amphibians, and fish that inhabit streams that would be crossed by the Project alternatives (Section 3.9, Aquatic Biology Resources), as well as other foreseeable transmission lines using the same corridors. These cumulative impacts are summarized below in **Table 5-21**.

Table 5-21 Estimated Cumulative Aquatic Habitat Alteration or Loss from the Project and Other Foreseeable Transmission Lines

Alternatives/Connectors	Habitat Loss (ft^2)
Region I	
I-A	0
I-B	0
I-C	7,200
I-D	0
Region II	
II-A	20,000

Table 5-21 Estimated Cumulative Aquatic Habitat Alteration or Loss from the Project and Other Foreseeable Transmission Lines

Alternatives/Connectors	Habitat Loss (ft^2)
II-B	39,200
II-C	44,000
II-D	14,400
II-E	30,400
II-F	14,400
Region III	
III-A	4,800
III-B	2,400
III-C	800
Region IV	
IV-A	800
IV-B	3,200
IV-C	2,400
Total	**175,200**

Conclusion

It is anticipated that similar design features and agency BMPs would be applied to the other foreseeable projects that may share the Project corridor. Based on implementation of these BMPs, as well as stream crossing design features, it is anticipated that cumulative impacts from construction and use of project water body crossings would not violate state water quality standards (Section 3.4, Water Resources). The Project proposes to use existing water rights and municipal sources for construction dust control and concrete batch plant water. This commitment would reduce the risk of stream dewatering that could cause short-term reductions in aquatic habitat. It is recommended that equipment cleaning programs be initiated to prevent the movement of aquatic invasive species from one drainage basin to another.

5.3.10 Special Status Aquatic Species

5.3.10.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – stream crossing locations within the transmission line construction ROW, and access road system.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.10.2 Cumulative Impacts

Based on species occurrence and habitat information, it has been estimated that 18 fish, four amphibians, and two invertebrates may occur within areas where Project construction could occur across all alternatives. The federally listed, candidate, and petitioned species include the following Colorado River system fish species: bonytail, Colorado pikeminnow, humpback chub, razorback sucker, and Virgin River chub. The

pallid sturgeon is a Platte River species. The northern leopard frog has been petitioned for listing, but was not found warranted.

The majority of these species have been affected by large-scale changes in flow regimes in the Colorado and Platte river systems as the result of reservoir development and downstream diversions. The northern leopard frog and other amphibians have diminished in abundance because of past development that has reduced habitat and increased disease exposure.

Summaries of the cumulative direct impacts to these species from TWE and other foreseeable transmission lines crossing the same habitat are provided in **Tables 5-22** through **5-24**.

Table 5-22 Cumulative Habitat Alteration or Loss to Special Status Aquatic Species in Region I

Species	Region 1 Alternative Corridor Habitat Loss (ft^2)			
	I-A	I-B	I-C	I-D
Colorado pikeminnow (acres of critical habitat crossed)	2	2	6	2
Colorado River Cutthroat Trout (habitat lost in ft^2)	0	0	1,600	0
Bluehead sucker (habitat lost in ft^2)	0	0	4,000	0
Flannelmouth sucker (habitat lost in ft^2)	0	0	5,600	0
Mountain sucker (habitat lost in ft^2)	0	0	3,200	0
Roundtail chub (habitat lost in ft^2)	0	0	4,000	0
Total (habitat lost in ft^2)	**0**	**0**	**18,400**	**0**

Table 5-23 Cumulative Direct Loss of Habitat for Special Status Aquatic Species in Region II

Species	Region II Alternative Corridors					
	II-A	II-B	II-C	II-D	II-E	II-F
Colorado pikeminnow (acres of critical habitat crossed)	4	8	8	8	4	8
Razorback Sucker (acres of critical habitat crossed)	4	6	6	6	4	6
Northern leopard frog (habitat lost in ft^2)	800	1,600	1,600	0	4,000	4,000
Columbia spotted frog (habitat lost in ft^2)	800	800	0	800	0	0
Boreal toad (habitat lost in ft^2)	1,600	0	0	0	0	
Bonneville cutthroat trout (habitat lost in ft^2)	5,600	2,400	0	2,400	6,400	6,400
Colorado River cutthroat trout (habitat lost in ft^2)	800	800	0	800	0	2,400
Southern leatherside chub (habitat lost in ft^2)	2,400	2,400	5,600	1,600	5,600	3,200
Bluehead sucker (habitat lost in ft^2)	5,600	800	2,400	0	2,400	0
Flannelmouth sucker (habitat lost in ft^2)	5,600	0	3,200	0	2,400	0
Mountain sucker (habitat lost in ft^2)	1,600	2,400	3,200	1,600	4,000	5,600
Roundtail chub (habitat lost in ft^2)	4,000	0	0	0	2,400	0
California floater (habitat lost in ft^2)	800	0	0	0	0	0
Southern Bonneville pyrg. (habitat lost in ft^2)	0	0	0	0	0	0
Total (habitat lost in ft^2)	**29,600**	**11,200**	**16,000**	**7,200**	**27,200**	**21,000**

Table 5-24 Cumulative Direct Impacts to Special Status Aquatic Species in Region III

Species	Region III Alternative Corridors		
	III-A	III-B	III-C
Acres of critical habitat crossed for federally listed aquatic species	0	0	0
Virgin River chub (habitat lost in ft^2)	1,200	1,200	0
Virgin River spinedace (habitat lost in ft^2)	3,600	0	0
Bluehead sucker (habitat lost in ft^2)	1,200	0	0
Roundtail chub (habitat lost in ft^2)	1,200	0	0
Meadow Valley Wash desert sucker (habitat lost in ft^2)	1,200	1,200	800
Meadow Valley Wash speckled dace (habitat lost in ft^2)	1,200	1,200	800
Moapa White River springfish (habitat lost in ft^2)	1,200	0	0
Arizona toad (habitat lost in ft^2)	2,400	800	800
Total (habitat lost in ft^2)	**13,200**	**4,400**	**2,400**

There would be no direct impacts to federally listed or sensitive aquatic species in Region IV; accordingly, there were no cumulative direct impacts analyzed for these aquatic species in Region IV.

Conclusion

The design features and protection recommendations for stream crossings described in Section 5.3.9 would be applied to any reasonably foreseeable transmission lines affecting special status aquatic species within the Project corridor. Accordingly, cumulative disturbance is unlikely to substantially reduce available habitat for these species within the Project corridors.

The Project plans to utilize existing water rights, thereby avoiding depletions in the Colorado and Platte systems. Other transmission lines, and other foreseeable projects may, or may not, entirely use existing rights, thereby triggering the need for consultation with the USFWS concerning depletion effects on listed fish species in these river systems (see discussion under Water Resources, Section 5.4.4).The potential cumulative impacts of these depletions, if they do occur, cannot be assessed until that consultation is completed.

5.3.11 Cultural Resources and Native American Concerns

5.3.11.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Archeological resources – Project-caused surface disturbance; Native American Concerns – Existing and foreseeable projects that are, or would be, located in landscapes and viewsheds containing traditional cultural properties, or other areas of concern. These areas typically would be located within 5 miles of a high voltage transmission line, but may extend to greater distances, depending on visibility (see Section 3.12, Visual Resources).
- Temporal
  - Construction – Less than 1 year at any location (disturbance to cultural sites).
  - Operation – Native American Concerns – Indefinite (minimum of 50 years).

5.3.11.2 Cumulative Impacts

Cultural resource file searches have been conducted for the Project alternatives. These searches included both historic and pre-historic sites. No field inventories will be conducted until after the agency preferred alternative is selected. The cultural research has indicated a wide variety of cultural resource features, including prehistoric Native American occupation, historic trails, and historic farmsteads and other structures. Federal agency, state agency, and tribal coordination is ongoing under the provisions of Section 106 of the National Historic Preservation Act. The lead agencies and collaborators are currently drafting a Programmatic Agreement, which will direct the interactions of the agencies and interested parties concerning the discovery and treatment of cultural resources during inventories and construction activities.

The only actions that would cumulatively impact the same cultural resources that the Project would are those reasonably foreseeable transmission line projects that have the potential to share the same corridors as the Project. These other projects would require approximately the same amount of ROW clearing, constructed roads, etc. as the proposed Project. Surface disturbance from these multiple transmission lines is expected to cause a cumulative reduction in the number of cultural resource sites in the area, including sites that are either eligible or not eligible for the National Historic Register.

Conclusion

Construction of one and the addition of more transmission lines across historic trails and other historically significant areas may cumulatively affect the integrity of these features (see Section 5.3.13). Accordingly, their construction and access would present the same direct disturbance impact and the same relative level of risk of indirect impacts (looting, etc.) as this Project. Even though that risk may not occur concurrently with the Project, it still represents a cumulative risk to any cultural resources in the Project corridor. Therefore, cumulative impacts and/or risk to cultural resources in Region I from reasonably foreseeable transmission lines would be approximately two to three times the direct impact or risk of indirect impact described in Section 3.11.6. Total risk of impacts to cultural resources in Region II would be approximately two times the risk described in Section 3.11.6. Total risk to cultural resources in Region III also would be two times the risk of impacts described in Section 3.11.6, with the exception of Alternative III-C, which has a total of four reasonably foreseeable transmission lines, and consequently, four times the risk. All alternatives in Region IV would represent two times the risk to cultural resources. Note that all of these transmission lines requiring ROWs across public lands would be subject to the same regulatory framework and protective actions as the Project.

5.3.12 Visual Resources

5.3.12.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Viewsheds of the Project reference lines or locations out to 20 miles where aboveground structures and associated ROWs are located in, or cross tree-covered landscapes, and out to 5 miles in shrub, grassland, and cropland landscapes (see Section 3.12).
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.12.2 Cumulative Impacts

The majority of the Project crosses developed landscapes. Forty percent of the lengths of Project alternative reference lines are located within 0.5 mile to mile of one or more existing transmission lines (**Figures 5-1** through **5-8**). Other human-made developments situated in proximity to the Project include agricultural fields and structures, commerce, oil and gas developments, pipeline ROWs, railroads, residences, and roads. A small portion of the Project alternatives traverse natural landscapes in viewsheds that contain no development beyond roads or trails. These include: viewsheds north and northwest of Baggs in Wyoming;

the Sand Wash Basin viewshed north of the Yampa River, the Texas Creek viewshed northeast of Baxter Pass in Colorado,and the areas west, north, east, and southeast of Caliente in Nevada.

The visual analysis for the Project has evaluated project compliance with BLM and USFS visual resource management classes. These findings are summarized in Section 3.13. The analysis determined that the Project would not conform to the visual resource management classes in a number of locations. These non-conformance areas were reviewed to determine if other transmission lines are proposed parallel to the Project in the same viewshed. In general, it was assumed that if the Project did not conform to visual management guidelines, then parallel and nearby transmission lines of similar size would not conform. Therefore, lead agency decision-making has to consider the visual resource impacts of individual projects within a broader utility corridor. **Figures 5-10** through **5-14** provides representative simulated cumulative condition of the three parallel transmission lines – EGS, EGW, and TWE as viewed from the following locations:

- The Outlaw Trail Scenic Highway/SH 789 in Wyoming;
- The Town of Pinto;
- The Town of Thompson;
- The Rainbow Gardens ACEC; and
- The Yampa River.

Figure 5-10 Simulated Cumulative Condition as Seen from the Outlaw Trail Scenic Highway/WY SH 789

Figure 5-11 Simulated Cumulative Condition as seen from Residences in the Town of Pinto across the Valley

Figure 5-12 Simulated Cumulative Condition as Seen from the Town of Thompson toward Sego Canyon

Figure 5-13 Simulated Cumulative Condition as Seen from the Recreational Road in the Rainbow Gardens ACEC

Figure 5-14 Simulated Cumulative Condition as Seen from Recreational County Road 23 Toward the Yampa River and Cross Mountain

Table 5-25 lists locations identified in the TWE Project visual analysis where: 1) the potential for high sensitivity viewers was identified; 2) the alternative would not comply with the applicable visual resource management class; and 3) another transmission line or other foreseeable projects are proposed in the same corridor and viewshed. These locations represent specific areas of concern for cumulative visual impacts.

Table 5-25 Areas of Concern for Cumulative Visual Impacts

Region	Figure/ Area	TWE Alt	Other Projects
Region I			
Outlaw Trail Scenic Highway/WY SH 789	**Figure 5-2 Area 1V-1**	A and C	EGS, EGW, oil and gas
Overland National Historic Trail	**Figure 5-2 Area 1V-2**	A, B, C, and D	EGS, EGW, oil and gas
Old Cherokee National Historic Trail	**Figure 5-2 Area 1V-3**	A, B, C, and D	EGS, oil and gas
Sand Wash Basin	**Figure 5-2 Area 1V-4**	A, B, and D	EGS
Little Snake River	**Figure 5-2 Area 1V-5**	A, B, and D	EGS
Yampa River and Cross Mountain Viewshed	**Figure 5-2 Area 1V-6**	A, B, and D	EGS
Region II			
Baxter Pass	**Figure 5-4 Area 2V-1**	B and C	EGS
Pony Express Trail	**Figure 5-4 Area 2V-2**	B and C	EGS
Green River/Crystal Geyser	**Figure 5-4 Area 2V-3**	B and C	EGS
Indian Creek and Potters Pond Campground	**Figure 5-4 Area 2V-5**	B	EGS
Skyline Drive Backway	**Figure 5-4 Area 2V-5**	B	EGS
Sego Canyon	**Figure 5-4 Area 2V-6**	B and C	EGS
Fantasy Canyon	**Figure 5-4 Area 2V-7**	D and F	EGS
Ninemile Canyon	**Figure 5-4 Area 2V-8**	D and F	EGS
Argyle Canyon	**Figure 5-4 Area 2V-9**	D and F	EGS
Region III			
Mountain Meadow Massacre Site	**Figure 5-6 Area 3V-1**	A	Sigurd-Red Butte
Region IV			
Rainbow Gardens ACEC	**Figure 5-8 Area 4V-1**	A	SWIP, ENTP

Conclusion

The cumulative visual impacts for reasonably foreseeable transmission lines would be very difficult to mitigate for in the aforementioned areas of concern. Cumulatively, each of these visually sensitive areas would have their viewshed unavoidably impacted by two or potentially three transmission lines, with resulting impacts to the visual experience to visitors to these areas. The locations and number of transmission lines would depend on the lead agencies' future decisions on if and where they choose to co-locate these lines.

5.3.13 Recreation Resources

5.3.13.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical Boundary – Developed and dispersed recreation; historic and recreation trails – The defined boundary of designated recreation areas, or the specific locations of historic and recreation trails within the viewsheds defined from visual resources (see 5.3.13).

- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.13.2 Cumulative Impacts

Existing recreation opportunities within the analysis area include dispersed recreation (hunting, fishing, hiking) that can be enjoyed across very large expanses of public land with limited restrictions on access (use of roads designated by the responsible federal and state land management agencies). Developed recreation includes campgrounds, picnic areas, access points for dispersed recreation, and pullouts for historic markers. That being said, the basis for both dispersed and concentrated recreational experience is tied to the relatively undeveloped landscape of the analysis area, which provides opportunities for outdoor recreation that is dependent upon either relatively undeveloped scenery (for non-consumptive recreationists) or intact habitat to support wildlife (for hunters). In both cases, the cumulative loss of native habitat to development provides an overall cumulative estimate of potential loss to recreational opportunity as well. This loss is summarized in **Table 5-26**.

Table 5-26 Cumulative Loss of Natural Habitat and Associated Recreational Opportunity

	Past and Present Development	RFFA Development	Total Available Natural Habitat	Percent of Cumulative Natural Habitat Loss in Analysis Area
Region I	416,881	46,149	7,266,195	6
Region II	797,587	44,442	9,251,491	9
Region III	162,965	26,584	7,136,217	3
Region IV	34,406	6,859	826,360	5

Conclusion

Table 5-26 illustrates a proportional loss in recreational opportunity associated with open undeveloped lands. This impact would not substantively reduce recreational opportunity for typical users on these lands as the proportion of lands still providing those opportunities is high. Additionally, many of those recreational users may not experience a significant loss in recreational experience as a result of this cumulative development (i.e., OHV users and hunters). However, this loss of natural habitat does represent an ongoing decrease in available open space that is being converted to development. This is particularly apparent in areas in Wyoming and Utah (Regions I and II) where large scale renewable and non-renewable energy projects continue to develop open space that is also used by recreationists.

5.3.14 Land Use

5.3.14.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Areas within the Project corridors; boundaries of irrigated land blocks and associated rural residences; boundaries of affected federal grazing allotments (BLM and USFS).
- Temporal – Indefinite (minimum of 50 years).

5.3.14.2 Cumulative Impacts

Ownership of the majority of the length of the Project alternatives is federal (primarily BLM and USFS). As a consequence, land management programs and designations represent the most important categories of land uses that affect the location of industrial facilities. Most state lands are leased for grazing or agricultural

purposes, or have been set aside as wildlife management areas. Recreational use is common throughout the project corridor with hunting representing the dominant recreational use. Boating, hiking, biking, and sight-seeing are other common recreational uses. Private lands are used for residential and agricultural purposes. The infrastructure support for all land uses includes highways, railroads, airports, water supply and electrical systems. Cumulative potential impacts to land use would be identical to those discussed in Section 3.14, Land Use, with the exception that those impacts would be increased as follows due to the potential for additional reasonably foreseeable other transmission lines to be located in the same corridor:

- Reference segments 20 and 30 for Alternatives I-A, I-B, I-C, and I-D would include the TWE, EGS, and EGW transmission lines (**Figure 5-1**).
- All other segments for Alternatives I-A, I-B, I-C, and I-D have the potential to have both the TWE and EGS transmission lines (**Figure 5-1**).
- All segments for Alternatives II-A, II-B, II-C, II-D, II-E, and II-F have the potential to have both the TWE and EGS transmission lines with the exception of Alternative II-C Segments 330.10 and 410 and the Lynndyl Alternative Connector (**Figure 5-3**).
- Segments 480, 500, 500.02, 500.05, 501, 503,504, 505, and 506 for Alternatives III-A, III-B, and III-C would have the potential to have both the TWE and SRB transmission lines. Segments of Alternative III-C also potentially could include the SRB, SWIP, and ENTP lines (**Figure 5-6**).
- Segments 610, 620, 630, 640, 650, 660, 700, 720, 740 for Alternatives IV-A, IV-B, and IV-C would have the potential to have both the TWE and either the SWIP or ENTP transmission lines (**Figure 5-7**).

Plan Amendments

An assessment of the need for plan amendments on BLM and USFS-administered lands affected by the Project is included in Chapter 4.0. Key considerations for plan amendments are conformance with existing land use plans and compatibility of the proposed projects with current land management categories. The previous cumulative impact discussions under the individual resources (especially visual resources and special designations under land use) have delineated areas where the additive impacts of past, present, and foreseeable projects (including the Project) may occur. These cumulative impacts will be considered by the land management agencies in developing plan amendments for both the Project and other foreseeable projects if they are approved.

Conclusion

Cumulative impacts on land use are most apparent where there are pinch points where one or more transmission lines would cause intrusion into areas that are managed for uses that may be incompatible with multiple transmission lines. These areas include the area where Segments 100, 101.10, 101.20, and 101.30 cross the Tuttle Conservation Easement. Although it may possible to fit one transmission line between the Tuttle Easement and the NPS lands for Deerlodge Road to Dinosaur National Monument, placement of more than one transmission line would require that one or the other cross either the NPS lands or the Tuttle Easement. Placement of a transmission line would be inconsistent with the management of either the easement or the NPS lands. Similarly, Segment 219.20 in the Emma Park area of Region II would allow only one transmission line without encroaching on either a USFS IRA or a 4-mile buffer for active sage grouse leks (see Section 3.8, Special Status Wildlife Species, for detailed description on potential impacts to sage grouse and Section 3.15, Special Designation Areas, for a detailed description on potential impacts to the IRA).

5.3.15 Special Designation Areas

5.3.15.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Area within the Project corridors that would be impacted by other development.
- Temporal – Indefinite (minimum of 50 years).

5.3.15.2 Cumulative Impacts

A detailed description of the SDAs that could be impacted by this project is provided in Section 3.15, Special Designation Areas. Cumulative impacts to the specific areas of these SDAs would be limited to those impacts caused by other potential transmission lines that potentially could share the utility corridor with the Project. These impacts would be similar to those described in Section 3.15, Special Designation Areas, with the exception that they would be proportionally greater based on having two or three transmission lines and associated construction disturbance with the potential to impact the same SDA. For the purposes of this cumulative analysis, it is assumed that there would be a 1,500-foot separation between all reasonably foreseeable transmission lines. Based on current proposals, it is reasonably foreseeable that up to three transmission lines could be placed in any one of these corridors crossing the SDAs. Accordingly, this analysis has estimated that the bulk of the 2-mile corridor would be impacted through clearing and/or visual impacts from the three transmission lines. A summary of SDAs where transmission lines have the potential to be co-located and the acreage of that SDA that would be impacted within that 2-mile corridor is given below in **Tables 5-27** through **5-32**.

Table 5-27 Region I: SDAs Within Shared 2-Mile Transmission Line Corridor

Special Designations Area	Alternative I-A Acres Within Shared 2-mile Corridor	Alternative I-B Acres Within Shared 2-mile Corridor	Alternative I-C Acres Within Shared 2-mile Corridor	Alternative I-D Acres Within Shared 2-mile Corridor
Dinosaur National Monument access road corridor (NPS)	16	90	90	90
Cherokee Divide NST SRMA	181	181	181	181
Total	**197**	**271**	**271**	**271**

Table 5-28 Region II: SDAs Within Shared 2-mile Transmission Line Corridor

Land Management Agency	Special Designation Area	Alternative II-A Acres Within Shared 2-mile Corridor	Alternative II-B Acres Within Shared 2-mile Corridor	Alternative II-C Acres Within Shared 2-mile Corridor	Alternative II-D Acres Within Shared 2-mile Corridor	Alternative II-E Acres Within Shared 2-mile Corridor	Alternative II-F Acres Within Shared 2-mile Corridor
BLM White River FO	Oil Spring Mountain WSA and ACEC	NA	1,241	1,241	NA	NA	NA
	White River Riparian ACEC	NA	143	143	NA	NA	NA
BLM Grand Junction FO	McInnis Canyons NCA	NA	1,925	1,925	NA	NA	NA
	Badger Wash ACEC	NA	310	310	NA	NA	NA
	Demaree WSA	NA	1,812	1,812	NA	NA	NA
BLM Vernal FO	Lower Green River ACEC	NA	NA	NA	1,239	NA	1,239
	Lower Green River WSR	NA	NA	NA	1,447	NA	1,447
	Lears Canyon ACEC	NA	NA	NA	489	NA	489
	Nine Mile Canyon ACEC	NA	NA	NA	1,453	NA	1,453
NPS	Dinosaur National Monument	3	NA	NA	3	3	3

Table 5-28 Region II: SDAs Within Shared 2-mile Transmission Line Corridor

Land Management Agency	Special Designation Area	Alternative II-A Acres Within Shared 2-mile Corridor	Alternative II-B Acres Within Shared 2-mile Corridor	Alternative II-C Acres Within Shared 2-mile Corridor	Alternative II-D Acres Within Shared 2-mile Corridor	Alternative II-E Acres Within Shared 2-mile Corridor	Alternative II-F Acres Within Shared 2-mile Corridor
Price FO	San Rafael Canyon ACEC	NA	NA	1,192	NA	NA	NA
	Rock Art ACEC	NA	NA	123	NA	NA	NA
Uinta National Forest	IRA 418008/ Chipman Creek	1,213	NA	NA	NA	NA	NA
	IRA 418009/ Willow Creek	5,605	NA	NA	NA	NA	NA
	IRA 418016/ Diamond Fork	40	NA	NA	NA	29	29
	IRA 418017/ Tie Fork	5,096	NA	NA	NA	2,732	2,732
	IRA 418021/ Hop Creek Ridge	4	NA	NA	4	4	4
	IRA 418028/ Golden Ridge	980	NA	NA	NA	980	980
	IRA 418029/ Nephi	14	NA	NA	4	4	4
	IRA 418015/ Strawberry Ridge	8	NA	NA	NA	NA	NA
Ashley National Forest	IRA 401009	NA	NA	NA	4,113	NA	4,113
	IRA 401010	NA	NA	NA	NA	7,601	NA
	IRA 401011	NA	NA	NA	NA	7,630	18
	IRA 401012	NA	NA	NA	NA	NA	734
	IRA 401013	NA	NA	NA	NA	NA	285
Manti-La Sal National Forest	Boulger-Black Canyon IRA	NA	1,414	NA	NA	NA	NA
	Cedar Knoll IRA	726	NA	NA	NA	726	726
	Coal Hollow IRA	1,713	NA	NA	NA	1,713	1,713
	San Pitch IRA	NA	1,262	NA	19	19	19
	East Mountain IRA	NA	1,902	NA	NA	NA	NA
	Nuck Woodward IRA	NA	NA	NA	51	NA	NA
	Oak Creek IRA	NA	NA	NA	786	NA	NA
Fishlake National Forest	North Pavant IRA	NA	NA	1,257	NA	NA	NA
	Oak Creek IRA	NA	13	NA	NA	NA	13
Total		**15,402**	**10,022**	**8,003**	**9,608**	**21,441**	**16,001**

Table 5-29 Region II: USFS Unroaded/Undeveloped Areas Within Shared 2-mile Transmission Line Corridor

National Forest	Unroaded/Undeveloped Areas	Alternative II-A Acres Within Shared 2-mile Corridor	Alternative II-B Acres Within Shared 2-mile Corridor	Alternative II-C Acres Within Shared 2-mile Corridor	Alternative II-D Acres Within Shared 2-mile Corridor	Alternative II-E Acres Within Shared 2-mile Corridor	Alternative II-F Acres Within Shared 2-mile Corridor
Ashley	Alkali Canyon	NA	NA	NA	1,856	NA	1,856
	Cottonwood	NA	NA	NA	NA	7,302	NA
	Sowers Canyon East	NA	NA	NA	NA	7,330	NA

Table 5-29 Region II: USFS Unroaded/Undeveloped Areas Within Shared 2-mile Transmission Line Corridor

National Forest	Unroaded/Undeveloped Areas	Alternative II-A Acres Within Shared 2-mile Corridor	Alternative II-B Acres Within Shared 2-mile Corridor	Alternative II-C Acres Within Shared 2-mile Corridor	Alternative II-D Acres Within Shared 2-mile Corridor	Alternative II-E Acres Within Shared 2-mile Corridor	Alternative II-F Acres Within Shared 2-mile Corridor
Fishlake	Browns Hole	NA	NA	5,230	NA	NA	NA
	Moroni Peak	NA	NA	100	NA	NA	NA
	Mount Terrill	NA	NA	984	NA	NA	NA
	North Pavant	NA	NA	2,054	NA	NA	NA
	Oak Creek	NA	191	NA	NA	NA	191
	Oak Ridge	NA	NA	2,655	NA	NA	NA
	The Rocks	NA	NA	325	NA	NA	NA
	Right Hand Fork	NA	NA	NA	NA	NA	422
	Mill Hollow	NA	NA	NA	NA	NA	172
	First Canyon	NA	NA	NA	NA	NA	NA
Manti-La Sal	Bulger-Black Mountain	NA	875	NA	NA	NA	NA
	East Mountain	NA	1,818	NA	NA	NA	NA
	Nuck Woodward –Gentry Mountain	NA	NA	NA	52	NA	NA
	Coal Hollow	1,754	NA	NA	NA	1,754	1,754
	San Pitch Mountains	66	1,617	NA	241	66	241
Total		**1,820**	**4,501**	**11,348**	**2,149**	**16,452**	**4,636**

Table 5-30 Region III: SDAs Within Shared 2-mile Transmission Line Corridor

Lead Management Agency	Special Designation Area	Alternative III-A Acres Within Shared 2-mile Corridor	Alternative III-B Acres Within Shared 2-mile Corridor	Alternative III-C Acres Within Shared 2-mile Corridor
BLM St. George FO, Utah	Beaver Dam Wash National Conservation Area	7,575	NA	NA
	Beaver Dam Slope ACEC	12,350	NA	NA
BLM Caliente FO, Nevada	Mormon Mesa Ely ACEC (Caliente FO)	10,720	10,615	NA
	Beaver Dam Slope ACEC (Caliente FO)	NA	306	NA
	Clover Mountains Wilderness	NA	545	NA
	Kane Springs ACEC (Caliente FO	NA	NA	6,340
	Delamar Mountains Wilderness	NA	NA	2,697
BLM Las Vegas FO, Nevada	Mormon Mesa ACEC (LVFO)	6,550	12,580	NA
	Coyote Springs Valley ACEC	NA	NA	24,327
	Arrow Canyon Wilderness	NA	NA	346
	Muddy River WSR	213	81	NA
	Meadow Valley Wash WSR	NA	374	NA

Table 5-30 Region III: SDAs Within Shared 2-mile Transmission Line Corridor

Lead Management Agency	Special Designation Area	Alternative III-A Acres Within Shared 2-mile Corridor	Alternative III-B Acres Within Shared 2-mile Corridor	Alternative III-C Acres Within Shared 2-mile Corridor
Dixie National Forest	Bull Valley IRA	313	NA	NA
	Moody Wash IRA	1,760	NA	NA
	Mogotsu IRA	3,734	NA	NA
	Atchison IRA	3,229	NA	NA
	Gum Hill IRA	NA	NA	NA
	Cove Mountain IRA	5,067	NA	NA
USFWS, Nevada	Desert National Wildlife Refuge	NA	NA	16,524
	Pahranagat National Wildlife Refuge	NA	NA	170
	Fish and Wildlife Proposed Wilderness #1	NA	NA	3,317
	Fish and Wildlife Proposed Wilderness #2	NA	NA	5,313
	Fish and Wildlife Proposed Wilderness #3	NA	NA	5,428
	Unit 2 Las Vegas Range Proposed Wilderness	NA	NA	243
	Unit 3 Sheep Range Proposed Wilderness	NA	NA	4,522
Total		**51,511**	**24,501**	**69,227**

Table 5-31 Region III: URUD Areas Within Shared 2-mile Transmission Line Corridor

Lead Management Agency	Special Designation Area	Alternative III-A Acres Within Shared 2-mile Corridor	Alternative III-B Acres Within Shared 2-mile Corridor	Alternative III-C Acres Within Shared 2-mile Corridor
Dixie National Forest	Bull Valley	436	NA	NA
	Moody Wash/Mogotsu	6,181	NA	NA
	Atchinson	4,217	NA	NA
	Cove Mountain	5,060	NA	NA
Total		**15,894**	**0**	**0**

Table 5-32 Region IV: SDAs Within Shared 2-mile Transmission Line Corridor

Special Designations Area	Alternative IV-A Acres Within Shared 2-mile Corridor	Alternative IV-B Acres Within Shared 2-mile Corridor	Alternative IV-C Acres Within Shared 2-mile Corridor
Sloan Canyon NCA (Las Vegas FO)	2,684	NA	NA
Black Mountain Wilderness (Las Vegas FO)	NA	NA	1,005
Sunrise Mountain ISA (Las Vegas FO)	1,312	532	532
Rainbow Gardens ACEC (Las Vegas FO)	10,563	2,590	2,590
River Mountains ACEC (Las Vegas FO)	3,127	73	NA
Lake Mead NRA (NPS)	25	12,871	14,482
Total	**17,711**	**16,066**	**18,609**

As noted for visual resources, the addition of one or more transmission lines in the same corridor may trigger inconsistencies with approved uses, requiring plan amendments, or other Project adjustments. The siting constraints for the Northern and Southern terminals, discussed individually in Section 3.15, do not impact resources affected by other reasonably foreseeable future actions.

In addition to the cumulative impacts from potential shared corridors disclosed in **Tables 5-27** through **5-32**, key potential cumulative impacts and/or routing concerns related to SDAs include:

- Region III, Alternative III-A in Utah: Milford. Alternative routes for the Project share a corridor that overlaps with the Phase 3 expansion of the Milford Wind Corridor Project. The offset distances between the transmission line projects and the wind farm projects would influence the degree of cumulative impacts on project operations and land commitments (**Figure 5-6 – Area 3D-1**).
- Region III, Alternative III-A in Utah: Mountain Meadows Massacre Site (Enterprise to Central). Both the Project and the Sigurd to Red Butte Project propose alternative routes within an existing corridor that overlaps with the recently designated Mountain Meadows Massacre National Historic Site (**Figure 5-6 – Area 3D-2**). This corridor already contains two existing transmission line corridors, as well as the newly constructed UNEV products pipeline. As a result, the Project has moved its reference line further east of the site, with resulting impacts on a Dixie National Forest IRA (see Section 3.15, Special Designation Areas).
- Region III, Alternative III-C in Nevada: Delamar to Pahranagat Valley. The Project would share the congressionally mandated 2,640-foot-wide LCCRDA corridor with an existing 230-kV transmission line, the ON Line/SWIP 500-kV transmission line under construction, and the Southern Nevada Water Authority proposed water pipeline and its new 230-kV transmission line in an area of steep terrain between the Delamar and Pahranagat valleys south of Alamo. This corridor is bounded on the south by the Delamar Mountains Wilderness, which constrains transmission line routing options. The ON transmission line project considered two alternatives outside the LCCRDA corridor in this segment in the Final EIS (BLM 2010). The alternative selected in the ROS includes the segment within the LCCRDA corridor (BLM 2011). The major issues in this area are roadway access to support multiple projects and siting all facilities within the currently defined utility corridor, given the separation requirements for high voltage transmission lines (**Figure 5-6 – Area 3D-3**).
- Region IV, Alternatives IV-A, IV-B, and IV-C in Nevada: Sunrise Mountain Instant Study Area, east of Las Vegas. An approximately 300-foot-wide ROW is available for a future transmission line across this Instant Study Area that was approved by Congress. As indicated in the reasonably foreseeable projects, at a minimum, the proponents that could utilize this remaining corridor width include Great Basin/NV Energy, Silver State Energy Associates, TransWest, and possibly ATC/Duke. Because both AC and DC transmission lines propose to cross the ISA, a major challenge will be to address the needs of both types of projects within the remaining corridor width across the ISA (**Figure 5-8 – Area 4D-1**). A Project alternative has been proposed that would be located at the ISA/ National Recreation Boundary to avoid this constraint.
- Another difficult transmission line siting area, west of the Sunrise Mountain ISA, is the segment from Lake Las Vegas to the outer suburban limits of Henderson. This area is highly congested with existing transmission lines, with limited options for additional transmission lines. Near Lake Las Vegas, the Project proposes to stay north of the existing transmission lines, then cross over Lake Mead Drive and the existing transmission lines, and then stay south of the existing transmission lines to maximize distance from the residential areas (**Figure 5-8 – Area 4D-2**).
- Region IV, Alternatives IV-B and IV-C in Nevada: Lake Mead NRA to Eldorado Valley. These alternatives were developed as options for routing through the constrained Lake Las Vegas/ Henderson area. These alternatives would parallel existing transmission lines within the NRA, as well as areas with no existing transmission lines. As noted previously, the NRA management plan does not allow new high voltage transmission lines within the NRA boundary. These alternatives

also would bypass Boulder City within a wide and congested transmission line corridor across steep terrain until the floor of the Eldorado Valley is reached (**Figure 5-8 – Area 4D-3**).

Conclusion

In Region I, cumulative impacts in shared corridors would be similar and relatively low (less than 300 acres) for all alternative corridors. In Region II, cumulative impacts on special designations from shared corridors would be relatively high for all alternative corridors, ranging from 8,003 acres (II-C corridor) to 16,001 acres (II-F corridor). For Region III, use of the Alternative III-C corridor would have the greatest impact (69,227 acres), followed by III-A (51,511 acres), and III-B (24,501 acres). In Region IV, corridor impacts would be very similar for all alternative corridors, ranging from 17,711 to 18,609 acres. For all regions with the exception of Region I, the cumulative effects of three transmission lines in the alternative corridors would have substantial impacts on SDAs. The consistency of overhead transmission with the existing management of each of these SDAs is discussed in detail in Section 3.15, Special Designation Areas.

There is considerable overap between USFS IRAs and USFS URUD areas. Consequently, they are not additive and are summarized separately from the other SDAs. There would be no impacts on URUD areas in Regions I and IV. In Region II, cumulative impacts on URUD areas would range from 1,820 acres to 16,452 acres. Transmission lines in Alternatives II-A and II-D corridors would have similar impacts (1,820 and 2,149 acres, respectively). Similarly, II-B and II-F have similar cumulative impacts (4,501 and 4,636 acres, respectively). Alternatives II-C and II-E have the highest cumulative impacts (11,348 and 16,452 acres respectively). In Region III, only the Alternative III-A corridor would have impacts on URUD areas (15,894 acres).

Prohibition on the building of roads in IRAs and URUD areas would greatly reduce the long-term disturbance to those areas. However, it would not eliminate all the cumulative visual impact and loss of vegetation associated with the clearing and placement of multiple transmission lines within a single 2-mile corridor.

5.3.16 Transportation and Access

5.3.16.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – Highway and road ROWs that would be used for Project activities.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.16.2 Cumulative Impacts

Existing actions include federal highways, state highways, and county and secondary roads under the jurisdiction of the BLM and USFS that form a network across all Project regions. Segments of transcontinental railroads traverse the I-80 corridor in Wyoming, and between Salt Lake City and Las Vegas. Major air force bases include the Hill AFB near Salt Lake City, and the Nellis AFB near Las Vegas. Each air force base has designated areas for low-level training flights. The major transportation network is illustrated on **Figures 3.16-1** through **3.16-4**.

The Project would utilize the existing highway and road system to access the ROW for construction. The Project proposes to extend the existing road system to provide access to transmission line structures over the long term. Because of Project location within existing utility corridors in many areas, nearby existing secondary roads could be used in many cases. Cumulative roadway deterioration effects and resultant increased maintenance costs for the responsible agencies likely would be incurred as a result of heavy loads and equipment travel during construction of the Project and other foreseeable projects.

The foreseeable projects likely would utilize the existing road system to the extent possible to minimize the establishment and maintenance of new roads. Because of separation requirements, independent spur roads would be constructed for each project. As a consequence, there would be a cumulative expansion of the existing road system within utility corridors shared by more than one transmission line project and oil and gas development projects.

The Project may require traffic controls at highway and secondary road intersections to manage equipment and material deliveries to the construction ROW. It is expected that the construction spreads for the Project would extend for many miles at one time, limiting the likelihood of concentrations of turning vehicles at intersections. It is unlikely that other foreseeable projects would be constructing their facilities in the same time frame and locations as the Project. Cumulative traffic delays and decreased public safety during construction are not anticipated.

Construction of the Project would add new aboveground facilities that would have to be considered in Nellis and Hill AFB military training areas intercepted by the Project. A BLM plan amendment for Hill AFB may be required; other agreements with Nellis AFB for military operations and potential interference with navigational aids may be needed. Other foreseeable projects that incrementally add to existing transmission line corridors in southwestern Utah and southern Nevada may be subject to similar reviews and approvals. In general, the cumulative effects of new transmission lines would be less in existing transmission line corridors, as compared to new corridors, where adjustments in military training would have to occur.

Conclusion

The amount and extent of existing roads in the overall analysis area indicate that cumulative transportation impacts on the transportation resources affected by the Project would be low. However, cumulative addition of multiple transmission lines in the Alternatives III-C and III-B corridors do present potential cumulative impacts that could affect the scope of training operations from both Nellis and Hill AFBs.

5.3.17 Social and Economic Resources

5.3.17.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical – The counties crossed by TWE alternatives.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.17.2 Cumulative Impacts

Construction schedule and peak work force for the Project may overlap in time with the foreseeable projects such that the cumulative projects would impact housing and services within the counties affected. These projects include concurrent construction of other energy projects, transmission lines and pipelines, as well as those with ongoing oil and gas development that require temporary housing and services for many nonlocal workers, and where there is limited infrastructure to accommodate an influx of new workers. Counties with substantial oil and gas development activity include Carbon County, Wyoming; Rio Blanco, Moffat, and Mesa counties in Colorado; and Uintah and Duchesne counties in Utah. Counties potentially affected by energy projects and transmission line or pipeline construction include Carbon and Sweetwater counties in Wyoming; Moffat, Routt, Rio Blanco, Garfield and Mesa counties in Colorado; Daggett, Uintah, Duchesne, Grand, Emery, Carbon, Wasatch, Utah, Sevier, Sanpete, Juab, Millard, Beaver, Iron, and Washington counties in Utah; and Lincoln and Clark counties in Nevada. The exact extent of that overlap is impossible to predict as it depends upon the timing of construction and operation of many projects, much of which is unknown.

Cumulative fiscal effects, including both additional revenues and increases in public expenditures to serve demand for public facilities and services, also are foreseeable as the Project and other foreseeable projects are constructed, and then operate over their useful life. State and local sales tax revenues (primarily short-term) generally are higher during construction but then decrease, while ad valorem/property (long-term) taxes are primarily a function of the revenue generated from transmission charges once the project is completed and energized. The ad valorem tax revenues associated with transmission line facilities would accrue primarily to counties, school districts, the state and other districts, rather than to the municipalities in which most construction and operations workers live.

The potential for cumulative effects would not arise with all TWE alignment alternatives, but rather would vary depending on the TWE alignment being considered. Furthermore, many of the cumulative effects would be temporary and could be viewed as beneficial by some members of the communities. Challenges in assessing potential cumulative socioeconomic effects also arise in conjunction with the influence of other factors on decisions of whether to proceed, postpone, or continue operations of an activity. Two such factors include uncertainty regarding the timing of necessary regulatory approvals and changing economics of resource development and production in response to market prices. A delay or postponement of a project because of such factors can substantially increase or diminish the potential for cumulative socioeconomic effects with the Project.

Long-term cumulative effects on future land use development patterns could result from the development and operation of multiple linear facilities in close proximity to one another, the results of which could have unknown community and economic development effects on local social and economic conditions.

No adverse human health and environmental effects disproportionately affecting minority and/or low income populations were identified in conjunction with the Proposed Action or action alternatives. Consequently, the project would not contribute to any cumulative environmental justice effects.

Conclusion

In general, cumulative socioeconomic impacts from past, present and reasonably foreseeable development in the analysis area have been beneficial to local communities. All of the proposed project alternatives have the potential to contribute to short-term cumulative impacts on housing availability and existing infrastructure in areas that are already impacted by heavy oil and gas or other energy development in Regions I and II. However, the relative cumulative impact of all the alternatives on these services would be proportionally very small. Cumulative short-term adverse impacts on housing and infrastructure from construction of multiple transmission lines are remote due to the difference in construction timing for the separate lines at any given location.

5.3.18 Public Health and Safety

5.3.18.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical Boundary
  - Construction – Equipment noise – 1 mile on either side of the ROW where equipment is operating; Hazardous materials – 250-foot-wide ROW.
  - Operation – EMF, Corona noise (human hearing), Stray Voltage – 250-foot-wide ROW; corona noise – radio and TV interference within a 2-mile-wide corridor.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.18.2 Cumulative Impacts

The majority of the alternatives would cross rural, undeveloped areas where background noise levels would be in the range of 40 dBA. Background urban noise would be greater in the Las Vegas Valley and near busy highways.

Construction of the Project would require noise-generating equipment that would operate during daylight hours at dispersed locations along the construction ROW. Equipment noise would occur over a short interval (months) at any particular location. The number of residences potentially affected by cumulative noise from construction of this and other reasonably foreseeable future transmission lines in shared corridors is provided in **Table 5-33**.

Table 5-33 Residences within 500 feet of Reference Line for TWE in Shared Corridors

	Alternative I-A	**Alternative I-B**	**Alternative I-C**	**Alternative I-D**	
Residences within 500’	0	0	0	0	
	Alternative II-A	**Alternative II-B**	**Alternative II-C**	**Alternative II-D**	**Alternative II-E**
	53	5	4	6	35
	Alternative III-A	**Alternative III-B**	**Alternative III-C**		
	9	2	2		
	Alternative IV-A	**Alternative IV-A**	**Alternative IV-A**		
	3	2	1		

It is unlikely that other foreseeable projects would be constructing facilities during the same time frame and in the exact same location; therefore, construction noise would not be cumulatively greater as a result of multiple transmission lines in the same corridor. However, the cumulative impact of the multiple transmission lines would be that the overall duration when residences would be periodically subjected to noise would range from 3 to 12 years. Additionally, the short-term periods when noise would be generated near these residences would occur from 2 to 4 times more than from the Project alone.

The generation of EMF, corona noise perceptible to nearby human receptors and stray voltage concerns would be confined to the immediate vicinity (within 300 feet of the centerline) of each transmission line. Consequently, the overall width of the corridor that could be impacted by cumulative corona noise from multiple transmission lines could be from 2 to 4 times greater (600 to 1,200 feet) than that from a single transmission line.

A detailed discussion on potential impacts of both construction and corona noise on humans is found in Section 3.18, Public Health and Safety.

<u>Conclusion</u>

Due to noise attenuation and low number of residences in proximity to the transmission lines, cumulative impacts on public health and safety from multiple transmission lines in Project corridors would be minimal. However, there is a possibility for short-term nuisance noise on these residences, particularly for those corridors where multiple transmission lines will be sited in the same corridor.

5.3.19 Wild Horses

5.3.19.1 Physical and Temporal Boundaries of Cumulative Impacts

- Physical Boundary
  - Construction – It is assumed that construction noise would have no impacts on wild horses as they would be able to easily move away from disturbance.
  - Operation – Loss of habitat from tower and facility construction within designated HMAs impacted by the proposed project.
- Temporal
  - Construction – Less than 1 year at any location.
  - Operation – Indefinite (minimum of 50 years).

5.3.19.2 Cumulative Impacts

The cumulative impact acreage within designated HMAs is summarized in **Table 5-34**.

Table 5-34 Estimated Cumulative Impacts from RFFA on Wild Horse HMAs

HMA	Cumulative Disturbance from RFFA (acres)	Total HMA acreage	Percent Disturbed from RFFA
Adobe Town	19	477,622	<1
Salt Wells Creek	73	1,170,714	<1
Eagle	11	660,700	<1
Hill Creek	1	72,130	<1
Total	**104**	**2,381,166**	**<1**

Conclusion

Cumulative impacts on HMAs would total 104 acres. This represents well under 1 percent of the available habitat for wild horses available in those HMAs. Accordingly, cumulative impacts to wild horses would be negligible. The Proposed Action and alternatives also would contribute negligibly to this permanent loss of habitat. The cumulative effects of the Proposed Action and alternative could restrict the use of helicopters for horse gathers in these HMAs due to safety concerns. However, the relatively low amount of disturbed area would indicate that these restrictions would not substantively impact BLM management of these HMAs.

5.3.20 Lands with Wilderness Characteristics

5.3.20.1 Physical and Temporal Boundaries

- Physical – Boundaries of affected LWCs
- Temporal – Indefinite (minimum of 50 years)

5.3.20.2 Cumulative Impacts

The potential cumulative impacts to LWCs were estimated based on those potential projects affecting the same areas as those affected by the proposed project. These impacts would be similar to those disclosed for the proposed project as they would involve additional transmission lines in the same corridor affecting the same units. These acreages could vary based on which route is picked for which transmission line (see

Section 3.20, Lands with Wilderness Characteristics, for details on impacts of alternative routes). Impacts from past and present actions to LWCs are largely inferred based on the amount of remaining LWCs that is disclosed in Section 3.20, Lands with Wilderness Characteristics. The estimated cumulative impacts on LWCs are summarized in **Table 5-35**.

Table 5-35 Estimated Cumulative Impacts to Lands with Wilderness Characteristics

	Percentage of LWCs Potentially Impacted by RFFAs
Region I	15
Region II	2
Region III	3
Region IV	No LWCs impacted by Project routes shared with other reasonably foreseeable routes

Conclusion

Cumulative impacts to lands with wilderness characteristics by reasonably foreseeable projects occupying the TWE corridor would be relatively low (1 percent or less). This would be true regardless of which alternative route is picked for the proposed project. However, it should be noted that cumulative impacts to LWCs that are not affected by the proposed project but are in the same regional area would continue to occur. Of particular note are potential future impacts to LWCs from widespread oil and gas development in Regions I and II.

6.0 Consultation and Coordination

This EIS was conducted in accordance with NEPA requirements, CEQ regulations, and the USDOI and BLM policies and procedures for implementing NEPA. NEPA and the associated laws, regulations, and policies require BLM and Western to seek public input and initiate agency consultation early and throughout the planning process to identify issues and develop a reasonable range of alternatives to ensure that environmental documents appropriately disclose the potential impacts of alternatives considered. Public involvement and agency consultation and coordination, which are at the heart of the process leading to this EIS, were achieved through Federal Register notices, public and informal meetings, individual contacts, media releases, and the Project website.

TransWest and Western are proposing to construct, own, and operate the TWE Project, which would be an EHV DC transmission system that stretches from south-central Wyoming to southern Nevada. Given the distance spanned, public involvement in this Project is critical to the success of the NEPA process. This chapter outlines the consultation and the coordination process for the proposed Project, including the general public as well as Tribal governments, and federal, state, and local agencies and organizations.

6.1 Public Involvement and Scoping

6.1.1 Public Involvement

NEPA requires full disclosure and open public participation in the federal decision making process, including those projects proposed by non-federal proponents that require federal approval. There are two key points during the development of an EIS that the general public is invited to participate in the process: 1) during the scoping period, and 2) during the 90-day public comment period of the Draft EIS.

The BLM and Western accepted written comments throughout all stages of Project development. Summaries of the public comments received during scoping are included in the Scoping Report (BLM and Western 2011), and are available online on the BLM webpage (http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/transwest.html). The issues and concerns identified by the public during the scoping period are summarized in Section 1.8 of the Scoping Report.

The release of this Draft EIS will be followed by a 90-day public comment period. Comments received will be reviewed and substantive comments will receive a response. Substantive comments and corresponding responses will be provided as an appendix to the Final EIS. Comments will be used to modify, clarify, and/or correct the Final EIS as appropriate.

6.1.2 Scoping Period

The following sections describe the pre-scoping and scoping process following TWE's amended 2010 ROW application submission and the publication of the Notice of Intent (NOI) in the Federal Register on January 4, 2011.

The BLM and Western conducted pre-scoping activities following the January 2010 SF 299 ROW application submittal. During the spring of 2010, comments were received from the interdisciplinary team, BLM FOs, Forest Service, and the Cooperating Agencies. These comments were considered in developing the alternative corridors presented to the public during the scoping period.

In addition to the brief summary of scoping found in Section 1.7, this section describes the public scoping process, including techniques used to notify the public about the opportunity to comment at this stage in the NEPA process.

6.1.3 Scoping Announcements

The initial step in the NEPA process is to notify the public, other government agencies, and tribes of the lead agency's intent to prepare an EIS. The scoping period was announced using a variety of tools:

- ***Federal Register*** – The BLM published the NOI in the Federal Register on January 4, 2011.
- **Newsletters** – a TWE Project newsletter was mailed to approximately 23,000 interested parties including federal, state, and local agencies, and tribes as well as potentially affected landowners within the proposed 2-mile-wide corridors for the proposed and alternative routes.
- **Advertisements** – BLM- and Western-placed display advertisements in local newspapers, and Public Service Announcements (PSAs) were submitted for broadcast on local radio and television announcing the public meetings.
- **Media Releases** – BLM Public Affairs personnel from each of the BLM field offices (FOs) were contacted as a part of the Media Plan to identify the appropriate media outlets and optimum time for conducting a public meeting in their area. The information was compiled and used to schedule the public scoping meetings and media placement for notification.
- **Public Libraries** – The BLM compiled materials and information presented at the scoping meetings into a three-ring binder and distributed it on January 21, 2011 to 23 public libraries located in communities where scoping meetings would be held for public access and review.
- **BLM TransWest Express Transmission Project Web Site** – The BLM established a Project website for the proposed Project. The website was initially used to notify the public of the scoping meetings, provide general Project overview information, as well as information to provide comments to the BLM regarding the proposed Project. The website currently serves as the electronic NEPA-related Project information source for all aspects and stages of the Project's NEPA process.

6.1.3.1 Scoping Meetings

Public scoping meetings offer an opportunity for the public to participate in the Project during the scoping period. The meetings promote information exchange about the proposed Project and to gather public input. The BLM and Western hosted 23 public scoping meetings throughout the Project area with a total attendance of 678 individuals. These meetings were conducted as informal open houses to allow for an open exchange of information and to provide the attendees the opportunity to ask agency personnel, the Project Applicant, and EIS contractor questions about the Project. Once attendees signed in to record their attendance, they were invited to review information about the project and the NEPA process at seven information stations. A list of meeting dates, locations, and attendance is listed below (**Table 6-1**).

Table 6-1 Public Scoping Meeting Dates and Locations

Meeting Location	Meeting Date
Vernal, Utah	Tuesday, January 25, 2011
Craig, Colorado	Wednesday, January 26, 2011
Rangely, Colorado	Thursday, January 27, 2011
Grand Junction, Colorado	Monday, January 31, 2011
Moab, Utah	Tuesday, February 1, 2011
Castle Dale, Utah	Wednesday, February 2, 2011
Duchesne, Utah	Monday, February 7, 2011
Nephi, Utah	Tuesday, February 8, 2011

Table 6-1 Public Scoping Meeting Dates and Locations

Meeting Location	Meeting Date
Delta, Utah	Wednesday, February 9, 2011
Richfield, Utah	Monday, February 14, 2011
Milford, Utah	Tuesday, February 15, 2011
Cedar City, Utah	Wednesday, February 16, 2011
St. George, Utah	Thursday, February 17, 2011
Pine Valley, Utah	Tuesday, February 22, 2011
Central, Utah	Wednesday, February 23, 2011
Enterprise, Utah	Thursday, February 24, 2011
Caliente, Nevada	Monday, February 28, 2011
Overton (Moapa Valley), Nevada	Tuesday, March 1, 2011
Henderson, Nevada	Wednesday, March 2, 2011
Las Vegas, Nevada	Thursday, March 3, 2011
Rawlins, Wyoming	Tuesday, March 8, 2011
Rock Springs, Wyoming	Wednesday, March 9, 2011
Baggs, Wyoming	Thursday, March 10, 2011

During the scoping period, BLM and Western met with representatives of several County Commissions. The meetings were scheduled to coincide with the scoping meeting in their respective county. The meetings provided Project information and explained the EIS process. Packets containing the materials available to the public at the scoping meetings were distributed to the Commissioners. In addition to the County Commissioners, BLM and Western met with the Clark County, Nevada, Conservation Program on March 1, 2011.

6.1.3.2 Scoping Comments

The BLM and Western received a total of 622 comment submittals (e.g., letter, comment form, email) containing 2,319 individual comments during the public scoping period. These comments were electronically submitted at the GIS comment station at the meetings, through the BLM Project website, or by U.S. Mail. Following the close of the public scoping period, comments were compiled and analyzed to identify issues and concerns. Within each comment submittal, individual comments were identified, reviewed, and entered into an electronic database.

6.2 Agency Participation and Coordination

Specific regulations require the BLM to coordinate and consult with federal, state, and local agencies about the potential of the proposed Project and alternatives to affect sensitive environmental and human resources. The BLM initiated these coordination and consultation activities through the scoping process and has maintained them through regular meetings regarding key topics with cooperating agencies throughout the NEPA process.

The BLM and Western invited interested federal, state, and county governments to participate as cooperating agencies for the preparation of the TWE Project EIS. To date, 51 agencies have accepted the

invitation. The coordination and consultation must occur in a timely manner and are required before any final decisions are made. Issues related to agency consultation include biological resources, cultural resources, socioeconomics, and land and water management.

6.2.1 Federal and State Agencies

6.2.1.1 Federal Agencies

The BLM and Western are in contact with the following federal agencies:

- Bureau of Indian Affairs Western Region, representing:
  - Rocky Mountain Region, Billings, MT
  - Southwest Region, Albuquerque, NM
- Bureau of Reclamation, Lower Colorado Region
- National Park Service,
  - Intermountain Region, Lakewood, Colorado
  - Pacific West Region, San Francisco, California
- Navy Region Southwest, San Diego, California
- Nevada Army National Guard
- U.S. Army, Region 8
- U.S. Army Corps of Engineers
  - South Pacific Division
  - Northwestern Division
- U.S. Fish and Wildlife Service representing:
  - Mountain Prairie Region, Lakewood, Colorado
  - Pacific Southwest Region, Sacramento, California
- U.S. Forest Service, Intermountain Region, Ogden, Utah
  - Utah Reclamation Mitigation Conservation Commission

6.2.1.2 State Agencies

The BLM and Western are also coordinating with the following state agencies:

- State of Colorado
  - Colorado Department of Agriculture
  - Colorado Parks and Wildlife
  - Colorado State Land Board
- State of Nevada
  - Nevada Department of Agriculture
  - Nevada Department of Wildlife
  - Nevada Division of State Lands

- State of Utah
  - Utah Department of Agriculture
  - Utah Division of Wildlife Resources
- State of Wyoming
  - Wyoming County Commissioners Association
  - Wyoming Department of Agriculture
  - Wyoming Game and Fish Department

6.2.2 Local Agencies

The BLM and Western are in contact with the following counties:

- Wyoming: Carbon, Sweetwater
- Colorado: Garfield, Mesa, Moffat, Rio Blanco
- Utah: Beaver, Carbon, Dagget, Duchesne, Emery, Grand, Iron, Juab, Millard, Piute, Sanpete, Sevier, Uintah, Utah, Wasatch, Washington
- Nevada: Clark, Lincoln

The BLM and Western are also coordinating with Little Snake River Conservation District, Medicine Bow Conservation District, Douglas Creek Conservation District, Saratoga-Encampment-Rawlins Conservation District, Sweetwater County Conservation District, White River Conservation District, and N-4 State Grazing Board.

6.2.3 Tribal Government-to-Government Consultation

It is the responsibility of all federal agencies to comply with the requirements of Section 106 of the NHPA and the ACHP's regulations when planning and carrying out their undertakings. In doing so, they are required to consult with Native American Tribes, SHPOs, local government entities, and other interested parties, depending on the specifics of the undertaking. Such consultation with Native American Tribes is central to the Section 106 process.

Tribal consultation for the Project began when a certified letter was mailed on July 20, 2010, to all federally recognized Native American Tribes either residing in or with cultural ties to the analysis area. The letter initiated formal government-to-government consultation and informed the Tribes of the proposed undertaking and solicited their concern/comments regarding possible historical and/or traditional ties to the area or the presence of properties of traditional religious and cultural importance. Included in the letters were a Project map, response form, and return address stamped envelope. The response form and return address envelope were enclosed with the letters as a means to inform the BLM and Western if any of the Tribes wish to participate in the consultation efforts or had any concerns associated with the Project.

Seven of the Native American Tribes responded to the initial consultation letter dated July 20, 2010 (Confederated Tribes of the Goshute Reservation, Duckwater Shoshone Tribe of the Duckwater Reservation, Ely Shoshone Tribe of Nevada, Las Vegas Paiute Tribe, Paiute Indian Tribe of Utah, Pueblo of Laguna, and Pueblo of Santo Domingo). A tribal member of the Ely Shoshone Tribe of Nevada requested copies of the Project maps, which were provided via email. The Las Vegas Paiute Tribe and Pueblo of Santo Domingo indicated on the response form that they do not require consultation at this time; however, they may request other opportunities to consult with the BLM and Western in the future. In their response, the Pueblo of Laguna indicated that the Project will not have a significant impact, but requested an opportunity to review any newly discovered archaeological sites and that photographs be taken of the sites.

Face-to-face meetings with the BLM and Western were requested by the remaining three Tribes (Goshute, Duckwater Shoshone, and Paiute Tribe of Utah).

BLM and Western met with the Paiute Tribe of Utah on December 1, 2010, and the Duckwater Shoshone as well as the Ely Shoshone on January 12, 2011. In January of 2011, the Utah BLM contacted the Confederated Tribes of the Goshute Reservation in response to their request for a meeting. During their discussion, the Goshute tribe determined that the Project was "not very close to their tribe," and therefore, no meeting would be necessary. The Pueblo of Laguna, Pueblo of Santo Domingo, and Las Vegas Paiute returned a response indicating that the information provided in the letter notification was sufficient and no further consultation was necessary. The Ely Shoshone sent a response requesting more information about the Project; the BLM contacted the tribe in August 2010 to discuss the Project. Representatives from the Ely Shoshone attended the meeting on January 12, 2011, with BLM and Western. At this meeting, the Duckwater Shoshone requested large Project maps of the areas where the Project could affect tribal lands. These maps were provided to the Duckwater Shoshone through the Ely, Nevada BLM FO.

In early 2011, follow-up phone calls were made to all the tribes to update tribal contact information. New information was update to the Project's tribal contact list in preparation for a second letter to be mailed in the fall of 2011. The second letter will request more focused information regarding tribal concerns and sites, provide additional information about the consultation process, development of the PA, and findings from the file search conducted in the winter of 2010/2011.

In late September 2011, a second set of letters was sent to the Native American Tribes listed on **Table 3.11-1** inviting them to participate in development of the draft PA. The letters included details of the Project, a description of historic properties identified through the files search, and information on a subsequent upcoming meeting on October 18, 2011, in Salt Lake City, Utah, to discuss the PA process. Only the Hopi Tribe responded to the second letter. The Hopi are interested in ongoing consultation on the Project, and requested copies of the cultural resources inventory report and any proposed treatment plans for review and comment. In addition, the Hopi requested an ethnographic overview of the Project area.

On April 19, 2012, the BLM and Western held an online conference call to discuss the status of the draft PA. The consulting parties listed in Section 3.11.1.1 and the Native American Tribes listed in **Table 3.11-1** were invited to participate on the conference call. None of the invited Native American Tribes participated on the call.

At the request of the Ute Tribal Council, the BLM and Western attended a Ute Tribal Council Meeting on May 31, 2012, and met with the Ute Mountain Ute Tribe, Southern Ute Tribe, and Ute Indian Tribe of the Uintah and Ouray Reservation to discuss the Project. The BLM and Western gave a presentation of the Project, and answered questions from the Tribes. In general, the questions focused on Project components, tribal consultation, BIA responsibilities, and ROWs on tribal lands. The Ute Mountain Ute are concerned about Project impacts to human remains, cultural landscapes, TCPs, and sacred sites.

Western and the BLM attended another Ute Tribal Council meeting on August 28, 2012. During the meeting, detailed Project maps of the 2-mile-wide transmission line corridors, a Project description, and schedule for completion of the draft EIS were presented to the Council members. As requested by the Council, Western and the BLM also met with the Ute Tribe's Energy and Minerals Department. Project information, a Project map, and contact information were left with the Council members and the Energy and Minerals Department. At this time, no other meetings have been held with the Ute Tribal Council.

On November 8, 2012, the BLM and Western held an online conference call to discuss the status of the draft PA. The consulting parties listed in Section 3.11.1.1 and the Native American Tribes listed in **Table 3.11-1** and Section 6.3.3 were invited to participate on the conference call. None of the invited Native American Tribes participated on the call.

On November 26, 2012, the BLM and Western sent letters to five additional pueblos as part of the consultation process. The five pueblos included the Pueblo of San Ildefonso, Pueblo of Santa Clara, Pueblo of Sandia, Pueblo of Taos, and Pueblo of Zia. Included in the letters were a Project map, response form, and return address stamped envelope. The letters included information on the Project, APE, PA process, and historic properties identified as a result of the files search. None of the contacted pueblos responded to the letters.

As of this date, no places of traditional religious and cultural importance to the contacted Native American Tribes have been identified in or near the analysis area through the government-to-government consultation efforts. Concerns expressed by the Tribes have been with human remains, TCPs, cultural landscapes, and sacred sites. Opportunities for the identification of locations of possible traditional religious and cultural importance that may be affected by the Project, as well as opportunities for the Tribes to express their concerns would remain open throughout the consultation process, which currently is ongoing and would continue through Project construction.

Consultation with the tribes and pueblos will continue throughout the Project as stipulated under EO 13175, November 6, 2000.

6.3 EIS Distribution List

In an effort to reduce printing costs, individuals on the mailing list receive postcard notifications directing them to download the EIS from the Project website at http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/transwest.html. In addition, the document is available on CD and as a limited number of hardcopy versions available at the locations listed below.

- BLM Wyoming State Office, Cheyenne, Wyoming
- BLM Rawlins FO, Rawlins, Wyoming
- BLM Rock Springs FO, Rock Springs, Wyoming
- BLM Little Snake FO, Craig, Colorado
- BLM White River FO, Meeker, Colorado
- BLM Grand Junction FO, Grand Junction, Colorado
- BLM Cedar City FO, Cedar City, Utah
- BLM Fillmore FO, Fillmore, Utah
- BLM Moab FO, Moab, Utah
- BLM Price FO, Price, Utah
- BLM Richfield FO, Richfield, Utah
- BLM St. George FO, St. George, Utah
- BLM Vernal FO, Vernal, Utah
- BLM Egan FO, Egan, Nevada
- BLM Caliente FO, Caliente, Nevada
- BLM Las Vegas FO, Las Vegas, Nevada
- USFS Dixie National Forest

A list of federal, state, and local agencies and representatives, Indian tribes, organizations, media, libraries, and individuals is being maintained throughout the NEPA process. The initial Project mailing list was developed by the BLM Wyoming State Office and has been supplemented as individuals express interest in

the Project. Individuals are provided with the opportunity to be added to the mailing list either through the Project website, registration at public meetings, or by contacting the BLM Wyoming State Office. A complete distribution list is available in the administrative record.

6.3.1 Federal Agencies and Representatives

6.3.1.1 Department of Interior Agencies

- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Bureau of Reclamation
- Fish & Wildlife Service
- Geological Survey (USGS)
- Mineral Management Service
- National Interagency Fire Center
- National Park Service

6.3.1.2 Department of Energy Agencies

- Federal Energy Regulatory Commission
- Western Area Power Administration

6.3.1.3 Other Federal Agencies

- Advisory Council on Historic Preservation
- Army Corp of Engineers
- Department of Agriculture (USDA)
- Animal and Plant Health Inspection Service
- Farm Service Agency
- Forest Service
- Natural Resources Conservation Service
- Department of Defense (DOD)
- Army
- Navy
- Air Force
- Department of Energy (DOE)
- Department of Transportation (DOT)
- Federal Aviation Administration (FAA)
- Federal Highway Administration
- Environmental Protection Agency

6.3.1.4 Congressional Delegations

There are 21 federal legislators (US Senate and House of Representatives) on the Project mailing list.

6.3.2 State and Local Agencies and Representatives

- 25 Colorado state divisions and departments.
- 37 Utah state divisions and departments.
- 12 Nevada state divisions and departments.
- 20 Wyoming state divisions and departments.
- 35 conservation districts and regional water districts.
- 77 state legislators (Senators and Congressmen, Governors and Lieutenant Governors)
- 41 counties.
- 111 cities and municipalities.

6.3.3 Indian Tribes

- Eastern Shoshone of the Wind River Reservation
- Winnemucca Indian Colony of Nevada
- Northern Arapaho Tribe of the Wind River Reservation
- Yerington Paiute Tribe of the Yerington Colony & Campbell Ranch
- Southern Ute Indian Tribe of the Southern Ute Reservation
- Yomba-Shoshone Tribe of the Yomba Reservation
- Ute Mountain Tribe of the Ute Mountain Reservation
- Fort Mojave Indian Tribe
- Confederated Tribes of the Goshute Reservation
- Hopi Tribe of Arizona
- Northwestern Band of Shoshone Nation
- Kaibab Paiute Tribe
- Paiute Tribe of Utah
- Navajo Nation
- Skull Valley Band of Goshute Indians of Utah
- San Juan Southern Paiute Tribe
- Ute Indian Tribe of the Uintah and Ouray Reservation
- Jicarilla Apache Tribe
- Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho
- Duckwater Shoshone Tribe of the Duckwater Reservation
- Ely Shoshone Tribe of Nevada
- Fort McDermitt Paiute-Shoshone Tribe of the Fort McDermitt Indian Reservation
- Las Vegas Tribe of Paiute Indians of the Las Vegas Indian Colony
- Lovelock Paiute Tribe of the Lovelock Indian Colony
- Moapa Band of Paiute Indians of the Moapa River Indian Reservation

- Paiute-Shoshone Tribe of the Fallon Reservation and Colony
- Pyramid Lake Paiute Tribe of the Pyramid Lake Reservation
- Reno-Sparks Indian Colony
- Shoshone-Paiute Tribes of the Duck Valley Reservation
- Summit Lake Paiute Tribe of Nevada
- Te-Moak Tribe of Western Shoshone Indians of Nevada
- Walker River Paiute Tribe of the Walker River Reservation
- Washoe Tribe of Nevada & California
- Pueblo of Acoma
- Pueblo of Cochiti
- Pueblo of Isleta
- Pueblo of Jemez
- Pueblo of Laguna
- Pueblo of Nambe
- Pueblo of Picuris
- Pueblo of Pojoaque
- Pueblo of San Felipe
- Pueblo of San Ildefonso
- Pueblo of San Juan
- Pueblo of Sandia
- Pueblo of Santa Ana
- Pueblo of Santa Clara
- Pueblo of Santo Domingo
- Pueblo of Taos
- Pueblo of Tesuque
- Pueblo of Zia
- Pueblo of Zuni
- Chemehuevi Indian Tribe

6.3.4 Organizations and Individuals

There are over 325 special interest groups and organizations on the Project mailing list. Organizations, individuals, and companies that have added their names to the mailing list during the Project receive notifications and other relevant Project mailings.

6.4 Preparers and Reviewers

As required by NEPA regulations (40 CFR 1502.17), **Tables 6-2** and **6-3** list the people responsible for disseminating and preparing this Draft EIS. The BLM and Western have retained AECOM as a third-party consultant to assist with the preparation of this EIS (**Table 6-4**). AECOM was selected by the lead agencies

to avoid any conflict of interest. AECOM has certified that it does not have any financial or other interest in the decisions to be made pursuant to this EIS.

6.4.1 Bureau of Land Management

Table 6-2 Bureau of Land Management EIS Team

Team Member	Responsibility/Resource
BLM Wyoming State Office	
Sharon Knowlton	Project Manager
Dennis Saville	Wildlife Program Lead
Ranel Capron	Archaeology Lead
Sherry Lahti-Roche	Visuals Lead
Brent Breithaupt	Paleontology
Ken Peacock	NEPA
Bob Means	Forestry
Beverly Gorny	External Affairs Lead
BLM Rawlins FO	
Heather Schultz	POC-RECO Project Manager
BLM Rock Springs FO	
Carol Montgomery	POC-Realty Specialist
BLM Colorado State Office	
Maryanne Kurtinaitis	POC-Realty Specialist
BLM Grand Junction FO	
Bridget Clayton	POC-Asst. Field Mgr
BLM Little Snake FO	
Louise McMinn	POC-Realty Specialist
BLM White River FO	
Janet Doll	POC-Realty Specialist
BLM Colorado River Valley FO	
Monte Senor	POC-Realty Specialist
BLM Utah State Office	
Shauna Derbyshire	POC-Realty Specialist
BLM Cedar City FO	
Brandon Johnson	POC-Realty Specialist
BLM Fillmore FO	
Clara Stevens	POC-Realty Specialist
BLM Moab FO	
Jan Denney	POC-Realty Specialist
BLM Price FO	
Connie Leschin	POC-Realty Specialist

Table 6-2 Bureau of Land Management EIS Team

Team Member	Responsibility/Resource
BLM Richfield FO	
Michael Utley	POC-Realty Specialist
BLM Salt Lake FO	
Dave Watson	POC-Realty Specialist
BLM St. George FO	
Shered Mullins	POC-Realty Specialist
BLM Vernal FO	
Cindy McKee	POC-Realty Specialist
BLM Nevada State Office	
Fredrick Marcell	POC-Realty Specialist
BLM Ely District	
Dan Netcher	POC-Realty Specialist
BLM Southern Nevada District Office	
Philip Rhinehart	POC-Realty Specialist

6.4.2 Western Area Power Administration

Table 6-3 Western Area Power Administration EIS Team

Team Member	Responsibility/Resources
Steve Blazek	Project Manager
Matt Blevins	Environmental Team Lead
Claire Douthit	NEPA Attorney
John Bremer	Lead Attorney
Ree Rodgers	Archaeology
Stephen Tromly	Archaeology
Misty Kae Sporer	Biology
Carey Ashton	Realty
Jay Braileigh	Biology
Steve Webber	Realty

6.4.3 AECOM

Table 6-4 AECOM EIS Team (Third-Party Consultant) List

AECOM Team Member	Responsibility/Resource	Degree/Certification	Experience (years)
Mark Raming	Project Director	B.A. Zoology and Ecology M.L.A. Landscape Architecture and Environmental Planning	37
Matt Petersen	Project Manager, Cumulative Impact Analysis	B.S. Fisheries M.S. Aquatic Ecology	18
Melanie Martin	Assistant Project Manager, Land Use Plan Amendments Lead, Lands with Wilderness Characteristics	M.S. Environmental Policy and Natural Resource Management Certificate, Advanced Study in Natural Resource Management B.S. Agriculture	15
David Fetter	Project Coordinator, Water Resources	B.S. Watershed Science	10
Julie Barraza	Wildlife Biology	B.S. Wildlife Biology	5
Bill Berg	Geology, Paleontology, Minerals	M.S. Geology B.S. Geology	24
Erin Bergquist	Vegetation, Special Status Plants	M.S. Ecology B.S. Rangeland Ecosystem Science B.S. Soil and Crop Science B.S. Environmental Studies and Economics	9
Rollin Daggett	Aquatic Species, Special Status Aquatic Species	M.S. Freshwater and Marine Biology B.S. Zoology	36
Chris Dunne	Resource Specialist, Land Use	B.S. Natural Resources Management	15
Ron Dutton Sammons & Dutton, LLC	Socioeconomics	M.S. Economics with specializations in Regional Economics and Public Utility Economics B.S. Economics	25
Scott Ellis	Senior Technical Advisor	B.A. Biology B.A. English	36
Anne Ferguson	Recreation	B.S. Natural Resource Recreation M.S. Environmental Sustainability LEED Accredited Professional	10
Steve Graber	Public Health and Safety	B.S. Natural Resources Management B.A. Economics	8
Allie Grow	Vegetation, Special Status Plants	B.S. Rangeland Ecosystem Science B.S. Soil and Crop Science	12
Janet Guinn	Public Involvement, Consultation and Coordination, Land Use, Special Designations, Recreation, Wild Horses	B.S. Magna Cum Laude, Psychology/ Anthropology	10

Table 6-4 AECOM EIS Team (Third-Party Consultant) List

AECOM Team Member	Responsibility/Resource	Degree/Certification	Experience (years)
Michael Heugh	Transportation	M.E. Transportation Engineering B.S. Mathematical Sciences	6
Brian Kennedy	Transportation	B.A. Special Major, Environmental Planning and Design	29
Spencer Martin	Biological Task Lead	M.E.M. Resource Ecology/Conservation Biology B.A. Biology	24
Terra Mascarenas	Soils	B.S. Soil and Crop Science, Concentration in Environmental Science Certificate of Technology	15
Kim Munson	Cultural Resources	M.A. Anthropology B.A. Anthropology	16
Andrew Newman	Wildlife Biology Lead	M.S. Natural Resource Management B.S. Conservation Biology	10
Merlyn Paulson	Visual Resources	M.L.A. Landscape Architecture B.L.A. Landscape Architecture and Environmental Planning	36
Nicole Peters	Resource Specialist	B.S. Natural Resources Management Minor in Business Administration	2
Brent Read	GIS	M.S. Watershed Science B.S. Forestry, Concentration in Forest Fire Science Minor in Spatial Information Management Systems	11
Vince Scheetz	Air Quality	M.S. Systems Management B.S. Mathematics B.S. Atmospheric Science	44
Jamie Schlangen	Wildlife Biology	M.S. Applied Ecology M.P.A. Natural Resource Management and Environmental Policy B.S. Wildlife Ecology	19
Brian Taylor	GIS	B.A. Geography, Emphasis in GIS Minor, Earth Sciences	5
Jason Thoene	GIS Lead	M.S. Geographic Information Systems B.A. Geology	12
Debbie Thompson	Document Production	A.A.S. Business Secretary	28
Ruth Idler	Document Production-Appendix I	General Business Education	25

Glossary

600-kV DC transmission line	A transmission line with a capacity of approximately 600-kilovolts of direct-current electricity.
100-year floodplain	The area that would be inundated by a flood with a recurrence interval of once in 100 years, on average. This can also be stated as areas that have a 1 percent chance of being flooded in a given year. (See **Floodplain**.)
Access road	Roads constructed to each structure site first to build the tower and line, and later to maintain and repair it. Access roads are built where no roads exist. Where county roads or other access is already established, access roads are built as track roads to the structure site (see **track roads**). Access roads are maintained even after construction, except where they pass through cultivated land. There, the road is restored for crop production after construction is completed.
Advisory Council on Historic Preservation	Established by the National Historic Preservation Act in 1966, the Advisory Council on Historic Preservation is an independent Federal agency that promotes the preservation, enhancement, and productive use of the nation's historic resources. It serves as the primary advisory agency for the president and congress on historic preservation policy.
Aerial photography	Used to identify and verify land uses within the project corridors and right-of-ways.
Agriculture	A habitat type characterized by land planted and kept in crops.
Albedo	The amount of solar radiation reflected from an object or surface, often expressed as a percentage (USEPA 2012).
All-American Road	To be designated as an All-American Road, the road or highway should meet the criteria for at least two of the Intrinsic Qualities that are nationally significant. The road or highway should also be considered a destination unto itself (DOT 2008).
Alluvium	Deposits left by flowing water, usually clay, silt, sand, or gravel.

Alternating current/direct current (AC/DC)	An alternating current (AC) power line alternates as a rate of 50 to 60 times a second (Hz), while a direct current (DC) power line produces a static electric field that does not alternate.
Alternative/Alternate	Options that a federal agency considers to address the significant issues and meet the purpose of and need for a proposed project in an environmental analysis. Also used to describe other routes under consideration.
Alternative Connectors	Locations where routes have been proposed that connect separate alternative routes in response to scoping comments and/or to avoid areas of identified major environmental, political, or engineering constraints. Many of the alternative connectors are bi-directional; e.g. they can be used to go from Alt. A to Alt. B, or vice-versa from Alt. B to Alt. A.
Alternative Routes	Multiple individual transmission line routes that each traverse from point A to point B in a separate and distinct way. The lead agencies are identifying and comparing three to six alternative routes within each of the four geographic regions: Region I - Northern Terminal to northwest Colorado near Rangely, Colorado; Region II – northwest Colorado to Intermountain Power Plant (IPP); Region III - IPP to northern Las Vegas area; and Region IV - northern Las Vegas area to Southern Terminal. For the purposes of the DEIS analysis, three to six alternative routes (Alternatives A, B, C, D, E, F) are identified in each region, and the impacts expected from each alternative route within each region will be analyzed based on the transmission reference lines, 250-foot ROWs, and transmission line corridors.
Alternative Variations	Locations where the alternative routes have an additional option available that is not a complete route in itself. Alternative variations provide an additional path around identified major environmental, political, or engineering constraints along an alternative route. For the purposes of the DEIS, the potential impacts from these variations will be compared from the portions of the alternative route they would replace, which diverge from the same beginning and ending points.
Ampere (A)	A unit of measurement of electric current, which is the rate that electrons flow in a wire; one ampere is 6.023 x 1023 electrons per second. The measurement is similar to gallons per minute of water in a pipe.
Animal Unit Month (AUM)	The quantity of forage typically consumed by a cow-calf pair over a month-long period.

Annual Average Daily Traffic	The total volume of traffic passing a point or segment of a roadway facility in both directions for 1 year divided by the number of days in the year.
Anthropogenic	Made by people or resulting from human activities (USEPA 2012).
Aquatic	Occurring in, or closely associated with, water.
Area of Critical Environmental Concern (ACEC)	An area where special management attention is required to protect and prevent irreparable damage to important cultural, historic, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.
Area of Potential Effect (APE)	The geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. Additionally, the APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16[d]).
Attainment Area	An area considered to have air quality as good as or better than the National Ambient Air Quality standards as defined in the Clean Air Act.
Back Country Byway	Provides an “off-the-beaten-path” adventure through landscape settings as diverse as the West itself. Most Byways traverse remote country, providing solitude and spectacular scenery in landscape settings ranging from soaring mountains and alpine meadows to sagebrush prairies and saguaro cactus deserts. They are classified by four types (Type I through IV) (BLM No Date 1).
Bald and Golden Eagle Protection Act	A law that prohibits the take, possession, selling, purchasing, bartering, or transporting of live or dead bald or golden eagles, or any parts, nests, or eggs of these birds.
Bedrock	Solid rock beneath the soil and superficial rock.
Best Management Practices (BMPs)	A practice or combination of practices that are the most effective and practical means of preventing or reducing the amount of environmental impact, including but not limited to, pollution generated by nonpoint sources to a level compatible with water quality goals.
Big game	Large animals that may be taken by hunters, pursuant to local government restrictions and regulations.

Biological Assessment	Information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. Biological assessments must be prepared for "major construction activities." See 50 CFR §402.02. The outcome of this biological assessment determines whether formal consultation or a conference is necessary. [50 CFR §402.02, 50 CFR §402.12]
Biological Opinion	Document which includes: (1) the opinion of the Fish and Wildlife Service or the National Marine Fisheries Service as to whether or not a Federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of designated critical habitat; (2) a summary of the information on which the opinion is based; and (3) a detailed discussion of the effects of the action on listed species or designated critical habitat. [50 CFR §402.02, 50 CFR §402.14(h)]
Blading	Use of a bulldozer, grader, or other construction equipment to level or shape a travel surface.
Border Zone	A zone on each side of the wire zone to the edge of the ROW, maintained to exclude vegetation more than 25 feet tall.
Bureau of Land Management (BLM)	A federal agency under the U.S. Department of the Interior that is responsible for carrying out a variety of programs for the management and conservation of resources on 258 million acres. The BLM manages multiple resources and uses, including energy and minerals, timber, forage, recreation, wild horse and burro herds, fish and wildlife habitat, wilderness areas, and archaeological, paleontological and historical sites. The BLM has been designated as a joint-lead federal agency for the environmental review of the TransWest Express Transmission Line Project.
Bureau of Indian Affairs (BIA)	Established in 1824, the Bureau of Indian Affairs is responsible for the administration and management of 55 million surface acres and 57 million acres of subsurface minerals estates held in trust by the United States of American Indian, Indian tribes, and Alaska Natives (BIA 2012).
Bureau of Reclamation	Established in 1902, the Bureau of Reclamation manages, develops, and protects water and related resources in an environmentally and economically sound manner in the interest of the American public (BOR 2011).

Candidate species	Plant and animal taxa considered for possible addition to the List of Endangered and Threatened Species. These are taxa for which the Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions. [61 FR 7596-7613 (February 28, 1996)]
Capacity	Refers to the amount of power a transmission facility (line, transformer, etc.) can reliably deliver. Capacity is measured in megawatts and is limited by the current (in amperes) that the facility can carry or the minimum voltage levels present at a substation (under either steady-state or outage conditions).
Carbon dioxide equivalent (CDE)	A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). Carbon dioxide equivalents are commonly expressed as “million metric tons of carbon dioxide equivalents ($MMTCO_2Eq$).” The carbon dioxide for a gas is derived by multiplying the tons of the gas by the associated GWP (USEPA 2012).
Carbon monoxide (CO)	An odorless and colorless gas formed from one atom of carbon and one atom of oxygen.
Center pivot irrigation system	A system for watering crops where water is pumped from a central location through a pipe supported on wheels that spins and distributes the water in a large, circular pattern.
Centerline	A line on a map or flagged on the ground that indicates the location of a linear feature such as a road or a transmission line. The linear feature is further defined by its total width, either for construction or operation, which is bisected into two equal parts by the centerline.
Checkerboard	In this document, “checkerboard” refers to a pattern of land ownership (jurisdiction) that resembles a checkerboard game surface, where federal and private ownership generally alternate every other square mile.
Circuit	An electrical device that provides a path for electrical current to flow, or along which an electrical current can be carried. In the case of high-voltage transmission, a set of wires energized at transmission voltages extending beyond a substation which has its own protection zone and set of breakers for isolation.
Class III (Pedestrian) Inventory	A Class III intensive field inventory to locate and record cultural resources and places of traditional, cultural, and religious importance to Native Americans.

Clean Air Act (CAA)	The federal law that defines the Environmental Protection Agency's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The last major change in the law, the Clean Air Act Amendments of 1990, was enacted by Congress in 1990. Legislation passed since then has made several minor changes. The Clean Air Act was incorporated into the United States Code as Title 42, Chapter 85.
Clean Water Act	The framework that regulates water quality standards and pollutant discharges into waters of the United States. Sections 303d and 305b require that water quality of streams, rivers, and lakes are assessed on a regular basis, that waters found to be in violation of water quality standards are listed as impaired, and that priorities be set for actions to improve the water quality.
Colluvium	Rock fragments, sand, etc., that accumulate on steep slopes or at the foot of cliffs.
Conditional Use Permit (CUP)	A CUP is given to certain classes of land use that are not permitted by right in some or all zones of a county, but are nevertheless recognized as being desirable to the full function of the county under appropriate circumstances. The purpose is to provide a means whereby proposals for such land uses may be examined on a case by case basis to determine whether, and under what conditions, these uses may be approved at a given site (Thurston County Permitting and Land Use 2011).
Conductor	The wire cable strung between transmission towers through which electric current flows.
Conservation agreement	A formal, written document agreed to by the FWS and/or NMFS or another Federal agency, State agency, local government, or the private sector to achieve the conservation of Bureau sensitive species and federally proposed, listed, and candidate species through voluntary cooperation. It documents the specific actions and responsibilities for which each party agrees to be accountable. The objective of a conservation agreement or strategy is to reduce threats to a Bureau sensitive species and federally proposed and listed species or its habitat. An effective conservation agreement or strategy may lower species' listing priority or eliminate the need for listing (BLM 2008).
Constraint	A resource or condition that potentially limits transmission line routes, including areas that are closed by regulations (e.g. municipal airports) or where impacts would be very difficult or impossible due to resource protection and other legal requirements.

Cooperating agency	A federal, state, or local government agency that has accepted an invitation to participate in the NEPA process by the lead federal agency. The invitation is generally formal and accompanied by the signing of a Memorandum of Understanding. Typically, a cooperating agency has jurisdiction by law or special expertise with respect to any environmental issue which will be addressed by the NEPA analysis EISs (40 CFR 1508).
Corona	Corona occurs in regions of high electric field strength on conductors, insulators, and hardware when sufficient energy is imparted to charged particles to cause ionization (molecular breakdown) of the air.
Council on Environmental Quality (CEQ)	Coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives. CEQ was established within the Executive Office of the President by Congress as part of the National Environmental Policy Act of 1969 (NEPA) and additional responsibilities were provided by the Environmental Quality Improvement Act of 1970.
Critical habitat	For ESA-listed species consists of: (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Act on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Act, upon a determination by the Secretary that such areas are essential for the conservation of the species. [ESA §3 (5)(A)] Designated critical habitats are described in 50 CFR §17 and 226.
Crucial range	Can describe any particular seasonal range or habitat component (often winter or winter/yearlong range in Wyoming) but describes that component which has been documented as the determining factor in a population's ability to maintain itself at a certain level (theoretically at or above the WGFD population objective) over the long term. [*Report on Standardized Definitions for Seasonal Wildlife Ranges*, Wyoming Chapter of the Wildlife Society, July 1990]
Cultural Property	A definite location of past human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence (BLM 2004).

Cultural Resources	The term “cultural resource” includes all landscapes, buildings, sites, districts, structures, or objects that have been created by or associated with humans and are considered to have historical or cultural value. Cultural resources also include **Traditional Cultural Properties**.
Culvert	A corrugated metal or concrete pipe used to carry or divert runoff water from a drainage; usually installed under roads to prevent washouts and erosion.
Cumulative effects	Effects that result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. Such impacts may individually have minor impacts, but collectively may have significant impacts.
Current	The amount of electrical charge flowing through a conductor (as compared to voltage, which is the force that drives the electrical charge), which is measured in amperes or amps.
dB(A)	Used to measure sound level via a logarithmic unit used to describe a ratio.
Debris flow	Rapid movement of water-charged mixtures of soil, rock, and organic debris down steep stream channels.
Decibel	A decibel is a unit for expressing relative difference in power, usually between acoustic signals, equal to 10 times the common logarithm of the ratio of two levels.
Decommissioning	Removal of Project facilities at the end of the operational life of the transmission line.
Demand	1) The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time. 2) The rate at which energy is being used by the customer.
Design Features	The specific measures the proponent has committed to using to decrease environmental impacts through the Project planning documents such as the POD. These have commonly been referred to as applicant committed measures in the past.
Design Options	Alternative transmission configurations, which may have the potential to meet the TWE Project purpose and need, depending on future energy market conditions and permitting decisions for other regional transmission systems. Three design options are described in the PDTR.
Dewatering	The elimination of water from waterways so that excavation can occur.

Direct effects	Direct effects are those caused by the Project at the same time and place as the impact, such as soil disturbance.
Distribution line	The structures, insulators, conductors, and other equipment used to deliver electricity directly to the customer, including commercial facilities, small factories, or residences.
Double-circuit transmission line	A transmission line composed of six electrical phases (two independent circuits of three phases each) and two lightning protection shield wires. One of the lighting protection shield wires is a steel overhead ground wire (OHGW), and the other is an optical ground wire (OPGW).
Early successional (or early seral)	An immature forest often characterized by a single-age class and open canopies; stands are between 1 and 30 years old.
Easement	A grant of certain rights to the use of a piece of land. A grant of easement across a private parcel for a transmission line typically includes the right to enter the easement area to build, maintain, and repair transmission facilities, including access roads. Permission for these activities is included in the negotiation process for acquiring easements over private land. The land itself remains in private ownership.
Ecoregion	Area where the ecosystems, and the type, quality, and quantity of environmental resources are generally similar as defined by the analysis of patterns and composition of biotic and abiotic phenomena including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology (Bryce et al. 1999; Omernik 1987, 1995; Wiken 1986).
Edge effect	Changes in vegetation and animal communities that are caused by one habitat type being immediately adjacent to a different habitat type. Edge effects can include changes in temperature, humidity, and plan and wildlife species present in the area.
Electric and magnetic fields (EMF)	Fields describing properties of a location or point in space and its electrical environment, including the forces that would be experienced by a charged body in that space by virtue of its charge or the movement of charges. The voltage, which is the “pressure,” produces an electric field that moves the electricity through wires. The current produces a magnetic field, which is a measure of how much electricity is flowing. Thus, wherever there is electric current flowing (including through any type of wiring), there is both an electric and a magnetic field.
Emergent	Plants that have their bases submerged in water.

Eminent Domain	When a utility company acquires property for public use through a court action, in which a court decides that the proposed subsequent use is in the public interest and also determines the compensation to be paid to the owner.
Encroachment Permit	Written permission from a landowner to enter a parcel of private property for the purposes of temporary activity, such as surveying, conducting environmental data gathering, etc.
Endangered species	Any species officially listed by the U.S. Fish and Wildlife Service or NOAA Fisheries as being in danger of extinction throughout all or a significant portion of their range.
Endangered Species Act of 1973 (ESA)	A law establishing a regulatory system to protect species that are at risk of extinction. NOAA Fisheries and the U.S. Fish and Wildlife Service decide whether to list species as Threatened or Endangered. Under the Act, federal agencies must avoid jeopardy to and aid the recovery of listed species.
Energy	In the electric utility industry, it represents the amount of power used or transmitted over a given amount of time.
Engineered Alignment	An engineered route, which will be prepared for the Agency Preferred Alternative. The Project Alignment will be based on engineering and design of the transmission line including specific structure locations. The Agency Preferred Alternative will be determined by the lead agencies, following the public review period on the DEIS, and in consultation with federal, state, and local cooperating agencies.
Environmental Impact Statement (EIS)	Part of compliance with the National Environmental Policy Act (NEPA), an EIS is a comprehensive public document that analyzes the impacts of a major federal action that may significantly affect the quality of the human environment. When complete, it is a tool for decision making as the EIS describes the positive and negative environmental effects of a proposed action, describes alternative actions and provides an analysis of environmental impacts and ways to mitigate such impacts across all alternatives considered in detail. An EIS examines physical and biological resources, resource uses, fire management, special designations, and social and economic conditions.
Environmental justice	A concept disproportionately high and adverse human health or environmental effects of a federal agency's programs, policies, and activities on minority or low-income populations.

Environmental Protection Measures	Environmental protection measures have been developed by the Companies to maintain environmental quality and meet requirements of various land management plans. These measures apply project-wide unless modified through negotiations with individual landowners or superseded by permits granted by federal, state, or local agencies.
Ephemeral stream	One that flows only in direct response to precipitation and whose channel is at all times above the water table.
Essential habitat	Those areas possessing the same characteristics as critical habitat for Threatened and Endangered but not species declared critical habitat by the Secretary of the Interior or Commerce (Wyoming Chapter of the Wildlife Society 1990).
Exclusion criteria	Categories assigned as exclusion criteria include locations with the highest level of sensitivity, such as areas with protective regulatory or legislative designations, or extreme physical constraints not compatible with transmission line construction or operation.
Extra-High Voltage Transmission Lines (230kV; 345 kV; 500kV)	Used for transmitting electrical energy over great distances. • Higher voltage lines are more efficient than lower voltage lines. A higher voltage transmission line will result in fewer losses than a transmission line with a lower voltage. • Higher voltage lines often have “bundled” conductors, meaning that multiple wires are hung from the same insulator. This increases the amount of power that can be carried on a single circuit.
Fault	An event occurring on an electrical system such as a short circuit, a broken wire, or an intermittent connection.
Feasible	Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, regulatory, technical, and safety factors.
Federally-listed	Species listed as **Threatened** or **Endangered** by the U.S. Fish and Wildlife Service.
Files Search	A records and files search conducted through the State Historic Preservation Office to identify all previously conducted cultural resources investigations and previously recorded cultural resources within a defined distance on either side of proposed rights-of-way, roads, and other project facilities.

Fire regime	A general description of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993; Brown 1995).
Fire Regime Condition Class (FRCC)	A discrete metric that describes how similar a landscape's fire regime is to its natural or historical state. FRCC quantifies the amount that current vegetation has departed from the simulated historical vegetation reference conditions (Barrett et al. 2010; Hann and Bunnell 2001; Hardy et al 2001; Holsinger et al. 2006). There are three condition classes (FRCC 1-3).
Floodplain	That portion of a river valley adjacent to the stream channel which is covered with water when the stream overflows its banks during flood stage.
Federal Land Policy Management Act of 1976 (FLPMA)	Public Law 94-579 of October 21, 1976. This law is often referred to as the Bureau of Land Management's Organic Act, which provides the majority of the Bureau of Land Management's legislative authority, direction, policy, and basic management guidance.
Fly yard	A Project-material staging area used specifically to support helicopter use.
Forb	An herbaceous plant that is not a grass or not grasslike.
Forest/Woodland	A habitat type characterized by being dominated by trees. Forests are densely covered by trees and have a continuous or nearly continuous canopy and little shade reaching the forest floor. In a woodland, trees are more widely scattered and sunlight reaches the floor, often supporting an understory of shrubs, grasses, and/or forbs.
Fragmentation	The breaking up of contiguous areas of vegetation/habitat into smaller patches.
Fugitive dust	Visible emissions released from sources other than stacks; for instance, dust blown from storage piles, road dust, emission leaking from sides of buildings or open areas in buildings.
Game species	Species of animals that are hunted or fished, for purposes of sport, recreation, and food capture (Coral Reef Info 2008).
Gauss	A unit of magnetic induction.

General Land Office (GLO)	The GLO was created in 1812 as an independent agency to oversee the surveying and sale of public lands and was charged with maintaining land survey data for the entire United States and its territories. The agency was later placed under the authority of the Department of the Interior and eventually merged with the Grazing Service to form the BLM. The BLM facilitates public access to GLO data through its website in the form of digital images of federal land patent and survey maps produced between 1820 and 1908.
Geographical Information System (GIS)	A computer representation of data that is geographically distributed in three dimensions. These data can be generated and displayed to show their physical location. Each data set with a certain type of information constitutes a “layer” in the GIS. GIS layers can be superimposed to show the spatial relationships of different items.
Gigawatt	A gigawatt is one billion watts, or one thousand megawatts; an electrical unit of power.
Grasslands	Habitat types dominated by grasses (family Poaceae) with little woody vegetation or other forbs. In the Analysis Area, most grasslands are dominated by introduced grass species, though some native grasslands are present.
Grazing allotments	Grazing allotments are categorized into one of three management categories: Improve (I), Maintain (M), or Custodial (C). These categories are based on present conditions, potential for improvement, other resource conflicts, and opportunities for positive economic return on public investments.
Greenfield	A piece of usually semi-rural property that is undeveloped except for agricultural use, especially one considered as a site for expanding urban development.
Greenhouse gas (GHG)	Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, carbon dioxide, methane, nitrous oxide, and ozone (USEPA 2012).
Ground electrode facility	Built to establish and maintain electrical current continuity during normal operations, and immediately following an unexpected outage of one of the two poles (or circuits) of the ±600-kV DC terminal or converter station equipment.
Habitat types	Communities of plants that typically occur together.
Hertz (Hz)	The unit of frequency in cycles per second; power systems in the U.S. operate with a frequency of 60 Hz.

High voltage	Lines with 230 kV or above electrical capacity.
Historic	Period wherein non-native cultural activities took place, based primarily upon European roots, having no origin in the traditional Native American culture(s).
Historic property	Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior.
Hydrology	The science of dealing with the properties, distribution, and circulation of water.
Improved roads	Actions taken physically by people to keep the road open to vehicle traffic (BLM 2012c).
Instant Study Area (ISA)	One of the 55 primitive and natural areas formally identified by the BLM through a final action published in the Federal Register before November 1, 1975. FLPMA required an accelerated wilderness review of these Wilderness Study Areas (BLM 2012d).
Indian tribe	An Indian tribe, band, nation, or other organized group or community, including a native village, regional corporation, or village corporation, as those terms are defined in section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians. Government-to-government consultation is required for any project between the federal government and the government of any potentially impacted tribe.
Indirect effects	Effects caused by the action that are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
Insulator	A ceramic or other non-conducting material used to keep electrical circuits from jumping over to ground.
Intermittent or seasonal stream	One which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.
Intermountain West	The region of North American lying west of the Rocky Mountains and east of the Cascade Mountains of Washington and Oregon and the Sierra Nevada Mountains of California.

Invasive species	A species that is not native to the habitat under consideration and whose introduction causes, or is likely to cause, economic or environmental harm (Executive Order 13112). Invasive plants are typically adaptable, aggressive, and have a high reproductive capacity.
Invertebrates	Animals that lack a back bone and are represented by a wide variety of taxonomic groups in freshwater environments.
Key Observation Point (KOP)	Viewing locations chosen to be generally representative of visually sensitive areas where it can be assumed that viewers may be affected by a change in the landscape setting from the Project. Views from KOPs are described by distance zones and are based on perception thresholds (changes in form, line, color, and texture).
Kilovolt (kV)	One thousand volts (see **volt**).
Lands with Wilderness Characteristics (LWC)	Lands with wilderness characteristics are those lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in section 2(c) of the Wilderness Act (see **Wilderness Characteristics**) (BLM 2012c).
Landslide	Any mass-movement process characterized by downslide transport of soil and rock, under gravitational stress, by sliding over a discrete failure surface; or the resultant landform. Can also include other forms of mass wasting not involving sliding (rockfall, etc.).
Large wood debris (LWD)	Any piece of downed wood larger than 4 inches in diameter and 6 feet long.
Lattice tower	A freestanding steel framework tower that is often used to support electrical transmission lines with voltages above 100 kilovolts.
Lead Agency	The agency or agencies preparing, or having taken primary responsibility for preparing an environmental document as required by NEPA. For the TransWest Express Transmission Project, the BLM and Western Area Power Administration are joint-lead agencies.
Lithic landscape	An area or region where aboriginal people habitually tested and procured tool stone and lithic materials.
Lithic scatter	Consists of stone material that has been left behind or dropped and can include stone tools such as projectile points, knives, or simply debris from stone tool manufacture or lithic procurement activities.

Load	The amount of electrical power or energy delivered or required at any specified point or points on a system. Load originates primarily at the energy-consuming equipment of customers.
Management Areas	Units of federal land having different management emphasis or direction.
Mass wasting	The slow downward slope of rock debris.
Megawatts (MW)	A megawatt is one million watts, or one thousand kilowatts; an electrical unit of power.
Micro-siting option	Micro-siting options are adjustments of the reference line that have been proposed to mitigate specific resource concerns. The adjustment remains within the 2-mile transmission line corridor.
Migratory bird	A bird that moves seasonally to different ranges to maximize breeding and feeding opportunities.
Migratory Bird Treaty Act	A law enacted in 1918 that prohibits pursuing, hunting, taking, capturing, killing, possessing, selling, bartering, purchasing, delivering, transporting, and receiving any migratory birds, parts, nests, or eggs.
MilliGaus (mG)	A unit used to measure magnetic field strength; one-thousandth of a **gauss**.
Mitigation	1) Avoiding or reducing possible adverse impacts to a resource by limiting the timing, location, or magnitude of an action and its implementation; 2) rectifying possible adverse impact by repairing, rehabilitating or restoring the affected environment or resource; 3) reducing or eliminating adverse impacts by preservation and maintenance operations during the life of an action.
National Ambient Air Quality Standards (NAAQS)	Established by the USEPA, the NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except the annual standards, which may never be exceeded (40 CFR 50).
National Conservation Area (NCA)	Area designated by Congress, generally, to conserve, protect, enhance, and properly manage the resources and values for which it was designated for the benefit and enjoyment of present and future generations (BLM 2012a).

National Environmental Policy Act of 1970 (NEPA)	Federal statute, signed into law on January 1, 1970, that contains procedures to ensure that federal agency decision makers take environmental factors into account. The two major purposes of the NEPA process are citizen involvement and better informed decisions. The Act establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment, and it provides a process for implementing these goals within the federal agencies. The Act also establishes the Council on Environmental Quality (CEQ) and requires an environmental impact statement on all major Federal actions significantly affecting the quality of the human environment. [42 U.S.C. 4332 2(2)(C).]
National Historic Landmark (NHL)	A historic property that the Secretary of the Interior has designated a National Historic Landmark.
National Historic Preservation Act (NHPA) of 1966, as amended	Act directing federal agencies to consider the effects of their programs and projects on properties listed or eligible for listing on the National Register of Historic Places. If a proposed action might impact any archaeological, historical, or architectural resource, this act mandates consultation with the proper agencies.
National Historic Trails (NHTs)	A congressionally designated trail that is an extended, long-distance trail, not necessarily managed as continuous, that follows as closely as possible and practicable the original trails or routes of travel of national historic significance (BLM 2012e).
National Historic Trails System Act	This Act (P.L. 90-543, as amended through P.L. 111-11, March 30, 2009) was passed in 1968 to establish a national trails system, including recreational, scenic, and historic trails. The Act specifies that the Secretary of the Interior and/or the Secretary of Agriculture is responsible for developing and administering the trails system.
National Park Service (NPS)	Established in 1916, the purpose of the National Park Service is to “conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations” (NPS 2011).
National Register of Historic Places (NRHP)	The official register of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture, established by the National Historic Preservation Act of 1966, as amended, and maintained by the National Park Service on behalf of the Secretary of the Interior.

National Scenic Byway	To be designated as a National Scenic Byway, a road should have at least one of six scenic byway intrinsic qualities (archaeological, cultural, historic, natural, recreational, and scenic) that is regionally significant (DOT 2008).
National Scenic Byway (NSB) Program	The National Scenic Byways (NSB) Program was established under the Intermodal Surface Transportation Efficiency Act of 1991, and reauthorized in 1998 under the Transportation Equity Act for the 21st Century. Under the program, the U.S. Secretary of Transportation recognizes certain roads as National Scenic Byways or All-American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. There are 150 such designated Byways in 46 states. The Federal Highway Administration promotes the collection as the America's Byways® (DOT No Date).
National Scenic Trails (NSTs)	A congressionally designated trail that is a continuous and uninterrupted extended, long-distance trail so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant resources, qualities, values, and associated settings and the primary use or uses of the areas through which such trails may pass (BLM 2012e).
National Wild and Scenic Rivers System	A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values and are preserved in a free-flowing condition (BLM 2012b).
Native American Graves Protection and Repatriation Act (NAGPRA)	NAGPRA was established in 1990 to provide a means for museums and curation facilities to return certain collected items to Native American and Native Hawaiian groups. The act pertains to the repatriation of human remains, funerary objects, sacred objects, and objects of cultural patrimony. Federal grants are awarded to indigenous groups and institutions holding collections under the act to assist in the repatriation process, which is overseen by the Native American Graves Protection and Repatriation Review Committee.
Naturalness	The degree to which an area generally appears to have been affected primarily by the forces of nature with the imprint of people’s work substantially unnoticeable (BLM 2012c).
Nitrogen oxides	A group of compounds consisting of various combinations of nitrogen and oxygen atoms.

No Action Alternative	The predicted result of the denial of the applications for Right-of-Way Grant and Special Use Permit. Under the No Action Alternative, the TransWest Express Transmission Project would not be constructed (i.e., no new transmission line, terminal converter stations and substations, or electrode bed systems).
NOAA Fisheries	The federal agency that oversees threatened and endangered anadromous fish species.
Nonattainment area	An area that does not meet air quality standards set by the Clean Air Act for specified localities and periods.
Northern Tier Transmission Group	A group of transmission providers and customers actively involved in the sale and purchase of transmission capacity that delivers electricity in the Pacific Northwest and mountain states.
Notice of Intent (NOI)	A public notice, published in the *Federal Register*, that an environmental impact statement will be prepared and considered in the decision making for a proposed action. It also provides background information on the proposed project in preparation for the scoping process.
Notice to Proceed (NTP)	Letter from a principal (client or owner) to a contractor stating the date the contractor can begin work subject to the conditions of the contract. The performance time of the contract starts from the NTP date.
Noxious weed	A legal term, meaning any plant officially designated by a federal, state, or local agency as injurious to public health, agriculture, recreation, wildlife, or property.
Off-highway vehicle (OHV)	Land vehicles mostly used for recreation purposes on public or private trails, beaches or fields, or in the woods; usually not legal to operate on public highways, streets or roads. Examples are all terrain vehicles (ATVs), off road motorcycles or dirt bikes, snow mobiles and four wheel drive vehicles such as jeeps and trucks.
Old growth	A forest type at least 200 years of age with moderate to low canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; numerous large snags; heavy accumulations of fallen wood; smaller trees in various age classes, as well as shrubs and herbaceous vegetation in the understory and on the forest floor.
Open camps or habitation sites	Defined minimally by the presence of one or more hearth features.
Opportunity	A resource or condition that can accommodate a transmission line route, including existing utility or transportation corridors.

Outage	Events caused by a disturbance on the electrical system that requires the provider to remove a piece of equipment or a portion or all of a line from service. The disturbances can be either natural or human-caused.
Overstory	Layer of foliage in a forest canopy including the trees in a timber stand. Tall mature trees that rise above the shorter understory trees (Conway 1973).
Ozone	Associated with the corona discharge of high-voltage transmission lines. Rapidly recombines back to O_2.
PacifiCorp (Rocky Mountain Power)	Rocky Mountain Power is the trade name under which PacifiCorp delivers electricity to more than 955,000 customers in the Rocky Mountain Power service area, which includes portions of Utah, Wyoming, and Idaho. It transmits electricity via a grid of transmission lines throughout a six-state region. PacifiCorp serves 1.7 million retail customers through its distribution system. Rocky Mountain Power operates under oversight and regulatory controls of the public utility commissions of Wyoming, Utah, and Idaho. PacifiCorp is a public utility under the jurisdiction of the FERC.
Palustrine	Northwest Wetland Inventory system that includes wetlands dominated by trees, shrubs, and persistent emergent plants associated with water bodies that cover less than 20 acres or with water less than 6.6 feet deep.
Parturition areas	Areas where habitat is appropriate for female big game animals to seclude themselves while giving birth to young in late spring or early summer. Such areas are usually characterized by ample hiding cover and forage.
Peak Hour	The hour of the day that observes the highest traffic volumes for a roadway or intersection. Typically 2 hours are reported, one in the AM and one in the PM.
Perennial Stream	One that flows with water present continuously during an average water year.
Petitioned species	A species for which a formal request is made to the U.S. Fish and Wildlife Service to give Endangered Species Act protection as either threatened or endangered. The Service reviews the information contained in the petition and other scientific information in their files to determine if further analysis is needed.
Physiographic	Pertaining to the features and phenomena of nature.

Plan of Development (POD)	A complete description of and design for the proposed project. It includes but is not limited to proposed plans, specifications, construction methods, schedules, restoration practices, and other information pertinent to the proposal; the plan becomes a part of the ROW grant. The plan can include sections for construction maintenance, and termination. The content of the plan will vary with the complexity of the proposal (BLM No Date 2).
Power	The rate at which work is done. The basic unit of measure for power is the watt (w).
Prevention of Significant Deterioration (review)	Federal pre-construction review for affected sources located in attainment areas for air quality. It is intended to prevent a new source from causing air quality to deteriorate beyond acceptable levels.
Prime farmland	A land use classification used by the USDA (7 CFR §657.5) where a favorable growing season, adequate precipitation or irrigation source, and soil characteristics result provide good to excellent crop production.
Project Alignment	The TWE Project alignment is defined as an engineered route, which will be prepared for the Agency Preferred Alternative. The Project Alignment will be based on engineering and design of the transmission line including specific structure locations. The Agency Preferred Alternative will be determined by the lead agencies, following the public review period on the DEIS, and in consultation with federal, state, and local cooperating agencies.
Project Description Technical Report (PDTR)	The PDTR provides a description of the TWE Project for the lead agencies' use in preparing Chapter 2 (Project Description and Alternatives) of the DEIS. The PDTR addresses the proposed TWE Project and alternatives presented by the lead agencies during public scoping. The PDTR also contains detailed design, construction, operation, and maintenance information for the agencies' use in the analyses of environmental impacts and mitigation measures adopted by the Applicant for the proposed TWE Project and Draft EIS alternatives.
Programmatic Agreement (PA)	A document that records the terms and conditions agreed upon to resolve the potential adverse effects of a federal agency program, complex undertaking, or other situations in accordance with 36 CFR § 800.14(b).
Proponent	TransWest Express LLC.

Proposed Action	The Proposed Action for the federal agencies is to consider whether to issue right-of-way grants across various parcels of public lands to allow the construction and operation of a new ±600-kV DC transmission line that would be located on federally managed lands between south-central Wyoming and southern Nevada. A 250 foot wide ROW will generally be required for the ±600-kV DC transmission line.
Proposed Route	The route of the proposed Project as sited and proposed by TransWest Express LLC and presented to the federal agencies for their consideration in applications for right-of-way grants.
Purpose and Need (NEPA)	Under the National Environmental Policy Act of 1969 (NEPA), the need to take an action may be something the agency identifies itself, or it may be a need to make a decision on a proposal brought to it by someone outside of the agency, for example, an applicant for a permit. Alternatives are measured against how well they meet the underlying need and best achieve the purposes to be attained.
Purpose and Need (project proponent)	As identified by an applicant or proponent of a project, the purpose and need describes the intended outcome of the project and the compelling reason why it is being proposed. Alternatives are measured against how well they meet the underlying need and best achieve the purposes to be attained.
Raptor	A bird of prey that feeds upon smaller animals.
Record of Decision (ROD)	The document that is prepared to substantiate a decision based on an EIS. The Record of Decision (ROD) is the final step for the BLM and USFS in the EIS process. The ROD states the final agency decisions, identifies the alternatives considered and discusses mitigation, enforcement and monitoring commitments.
Reclamation	Returning disturbed lands to a form and productivity that will be ecologically balanced.
Recreation Opportunity Spectrum (ROS)	Forest Service classification system that uses a scale ranging from primitive to urban for the purpose of planning and managing recreational resources.

Reference Line Segments	Reference lines (see **Transmission Reference Lines**) are divided into "segments," which are identified by a nomenclature of letters and/or numbers. The letters correspond to the state in which they are located. The segments will be used to identify alternative end-to-end routes for the transmission line and to quantify and compare potential impacts resulting from these alternative routes. For the TWE Project DEIS analysis a series of reference line segments have been combined and follow a potential alternative route between common geographic points for analysis in the EIS.
Regeneration station	A station amplifying the signals between substations or regeneration stations when the distance between exceeds 55 miles. Regeneration stations consist of a building 12 by 32 by 9 feet tall, a fenced yard, access road, and distribution power supply from the local distribution system. They are typically built very near the transmission line and have the fiber optic cable entry and exit runs to connect to the overhead ground fiber optic cables along the transmission line.
Reliability	Transmission systems must be built with sufficient levels of redundancy to enable the transmission system to reliably operate in the event of the loss of any single element (i.e., transmission line segment or substation element). Following loss of any single element, the transmission operator has 20 minutes to readjust system flows, thereby bringing flows on lines and transformers to within normal ratings, in preparation for the next facility outage.
Revegetation	The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance, such as reseeding.
Right-of-way (ROW)	Refers to the area, generally centered on a specified centerline, requested by the Proponents of BLM and of other landowners and managers for the construction, operation, and maintenance of a linear feature such as a road, electric transmission line, or pipeline.
Right-of-way (ROW) grant	An authorization to use or occupy a specific piece of public land for a certain project, such as a road, pipeline, transmission line, or communication site. A ROW grant authorizes rights and privileges for a specific use of the land for a specific period of time. For a transmission line, this includes the construction, operation, maintenance, and termination of the Project. Generally, a ROW is granted for no longer than 30 years.

Riparian areas	Vegetation communities that occur adjacent to waterways such as streams, rivers, springs, ponds, lakes, or tidewater and that provide habitat for numerous plant and animal species. They generally occupy transitional areas between aquatic and upland habitats and may function as vegetative buffers for aquatic resources.
Riverine system	Wetland inventory system that includes wetlands not dominated by trees, shrubs, or persistent emergents that are contained within a river channel.
Roadless area	An area of undeveloped public land typically exceeding 5,000 acres within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use.
Safety Performance Functions	A mathematical relationship (model) between frequency of crashes by severity and the most significant causal factors on a specific highway.
Sage-grouse lek	A location used by male sage-grouse, generally every year, to assemble during the mating season and engage in competitive displays that attract females.
Scenery Management System (SMS)	The Scenery Management System (SMS) replaces the Visual Management System (VMS) used in the most recent Medicine Bow National Forest Land and Resource Management Plan. The SMS provides an overall framework for the orderly inventory, analysis, and management of scenery. The new system applies to all national forests and grasslands administered by the Forest Service and to all Forest Service management activities. The SMS process uses particular ecosystems as the environmental context for aesthetics.
Scenic Backway	A paved or dirt road reaching secluded areas of natural beauty.
Scenic Byway	A public road having special, scenic, historic, recreational, cultural, archeological, and/or natural qualities that have been recognized as such through legislation or some other official declaration (DOT 2008).
Scenic Quality Rating	The relative scenic quality (A, B, or C) assigned to a landscape by applying the scenic quality evaluation key factors; scenic quality A being the highest rating, B a moderate rating, and C the lowest rating (BLM 1984).

Scoping	Part of the federal environmental analysis process required under NEPA where significant issues are identified for detailed analysis. Scoping includes, but is not limited to, a formal scoping period early in the analysis process in which members of the public are invited to review the proposed project and identify possible issues or concerns with the project.
Section 106	Under Section 106 of the National Historic Preservation Act of 1966, as amended, federal agencies must identify and evaluate cultural resources and consider the impact of undertakings they fund, license, permit, or assist on historic properties eligible for inclusion in the National Register of Historic Places. The federal agencies must afford the State Historic Preservation Officer and the Advisory Council on Historic Preservation the opportunity to comment on these undertakings.
Sedimentation	The deposition or accumulation of sediment.
Sensitive species	Those plants and animals identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.
Sensitivity levels	Sensitivity levels are defined by the BLM as the measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels (BLM 1984).
Seral	Pertaining to the stages of ecological succession occurring in communities of plants and animals until the climax is reached.
Severe winter relief range	A documented survival range which may or may not be considered a crucial range area as defined above. It is used to a great extent, only in occasionally extremely severe winters (e.g., 2 years out of 10). It may lack habitat characteristics which would make it attractive or capable of supporting major portions of the population during normal years but is used by and allows at least a significant portion of the population to survive the occasional extremely severe winter. [Wyoming Chapter of Wildlife Society 1990]
Shrubland	A habitat type characterized by woody vegetation smaller than trees (in general, having multiple main stems and being less than 20 feet in height and six inches diameter at breast height at maturity).
Sight Distance	Distance a road user can see before the line of sight is blocked by a hill crest or an obstacle.

Single-circuit transmission line	A transmission line composed of three electrical phases and two lightning protection shield wires. One of the lightning protection shield wires is a steel OHGW, and the other is typically an OPGW.
Snag	A dead or dying tree.
Soil compaction	Operation of motorized vehicles on moist soils, especially heavy equipment, is likely to cause compaction of the surface layer, which may increase runoff, decrease infiltration and aeration, and reduce soil productivity by making it more difficult for plant roots to establish or obtain soil moisture and nutrients.
Soil creep	Slow mass movement of soil downslope due to outward expansions brought on by water infiltration, which leads to downward movements under gravity as water moves out of the soil (ITS Tutorial School 2012).
Soil erosion	The movement of soil particles, usually as a result of wind or water forces. Many factors affect soil erosion, including soil grain size, cohesion factor, soil moisture content, type and amount of vegetative cover, precipitation amount and intensity, steepness of slope, and wind speed.
Solitude	The state of being alone or remote from others; a lonely or secluded place (BLM 2012c).
Span length of transmission circuit	The distance between two transmission support structures traveled by the conductors, measured either horizontally or along the conductors from the end of one insulator string to the end of the next insulator string.
Special Recreation Management Area (SRMA)	SRMAs recognize unique and distinctive recreation values and are managed to enhance a targeted set of activities, experiences, benefits, and recreation setting characteristics, which become the priority management focus.
Special Recreation Permit (SRP)	Issued by the BLM and the USFS for some recreational uses on federal lands and waters. SRPs are issued as a means to control visitor use, protect recreational and natural resources, and provide for the health and safety of visitors.
Special Status Species	Species of plants or animals that have been designated by government agencies as needed special monitoring, conservation, or protection, usually due to declining populations. This group includes federally endangered and threatened species as well as other designations.

Special Use Permit (SUP)	A legal document that allows occupancy, use, rights, or privileges of National Forest System (NFS) land. The authorization is granted for a specific use of the land for a specific period of time.
Species	A group of interbreeding individuals not interbreeding with another such group; similar and related species are grouped into a genus.
Staging Area	A fenced, generally flat location where materials, equipment, and vehicles are stored prior to their use in construction of the transmission line or its ancillary facilities.
State Historic Preservation Office (SHPO)	Created under Section 101 of the NHPA to survey and recognize historic properties, review nominations for properties to be included in the National Register of Historic Places, review undertakings for the impact on the properties as well as support federal organizations, state and local governments, and the private sector. States are responsible for setting up their own SHPO; therefore, each SHPO varies slightly on rules and regulations.
Stray voltage	Stray voltage is an extraneous voltage that appears on grounded surfaces in buildings, barns, and other structures, including utility distribution systems.
Stream Channel	(By statute definition in Idaho) A natural water course of perceptible extent that has definite beds and banks, and which confines and conducts continuously flowing water. Continuously flowing water is defined as an amount of water capable of providing for the migration and movement of fish, but excludes those portions of streams that naturally go dry at the location of the alteration.
Subsidence (soil)	The sinking of the earth's surface because of the withdrawal of water or mineral resources.
Substation	A fenced site containing switching and transformation equipment needed to transform one voltage to another and for protecting and controlling transmission and distribution lines. A substation is used to raise voltages for long distance transmission and to lower transmission voltage for distribution to the end users.
Summer or Spring-Summer-Fall range	A population or portion of a population of animals use the documented habitats within this range annually only (from the previous winter) to the onset of persistent winter conditions (variable, but commonly this period is between 5/1 and 11/30 or shorter in Wyoming). (5/1 – 11/14, adopted by WGFD in 2004) [Wyoming Chapter of Wildlife Society 1990]

Switches	Devices used to mechanically disconnect or isolate equipment; found on both sides of circuit breakers.
System Alternatives	System alternatives are alternative transmission configurations, which may have the potential to meet the TWE Project purpose and need, depending on future energy market conditions and permitting decisions for other regional transmission systems. Three system alternatives are described in the PDTR.
Take	Harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct toward a species listed under the ESA.
Talus	Rock debris that has accumulated at the base of a cliff or steep slope.
Tap	The point at which a transmission line is connected to a substation or other electrical device to provide service to a local load.
Temporary Use Permit	A permit given for temporary use of federally managed lands. A temporary use permit is typically issued for the construction of a project, followed by a special use permit or long-term right-of-way grant for the operation of the project.
Terrestrial	Occurring on land.
Threatened and Endangered Species (TES)	Threatened and endangered species listed or candidates for listing under the federal Endangered Species Act (ESA) and those species listed by the BLM and the Forest Service as sensitive.
Threatened species	Those species officially listed by the U.S. Fish and Wildlife Service that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range. [ESA §3(20)]
Topsoil	The uppermost soil layer, generally ranging from a few inches to less than one foot in thickness. Topsoil is the site of greatest organic content, contains the most soil nutrients, and supports the greatest amount of plant life.
Track road	Unimproved dirt roads without surfacing or regular maintenance, generally 8 to 12 feet in width.
Traditional Cultural Property (TCP)	A property that is eligible for the NHRP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

Transformers	Electrical equipment usually contained in a substation that is needed to change voltage on a transmission system.
Transmission line	A system of structures, wires, insulators, and associated hardware that carry electric energy from one point to another in an electric power system. Lines are operated at relatively high voltages varying from 69 kV up to 765 kV, and are capable of transmitting large quantities of electricity over long distances.
Transmission Line Corridors	Geographic areas following a route that identify a specific width (generally between two and six miles) within which the proposed 250 foot-wide TWE Project transmission line right-of-way (ROW) would be located. Corridor widths have varied among the various studies completed for TWE Project planning. For purposes of the DEIS analysis, the Proposed and Alternative Corridors have been refined to generally two miles wide. In limited areas, the corridor widths may be greater or lesser due to routing constraints, as requested by the joint lead agencies. These corridors will be evaluated in the DEIS to document the range of resource impacts which could result from transmission line construction, operation, and maintenance within the corridors. Corridor locations and widths have been, and will continue to be, refined throughout the National Environmental Policy Act (NEPA) process.
Transmission Line Routes	Conceptual paths that traverse from point A to point B, which would fulfill the Project purpose in a general sense. Routes are not defined with specific lines on the ground or depicted on a map, and do not have an area, width, or line associated with them; however route alternatives are analyzed for consideration of impacts based on reference lines that accomplish each route alternatives.
Transmission Reference Lines	Preliminary, non-engineered routes within corridors that were determined based on environmental and engineering constraints and constructability review. The reference line is generally bounded on each side by one mile of corridor. For purposes of the DEIS analysis, reference lines serve as preliminary centerlines for the location of the ±600 kV DC transmission line ROWs, and impacts expected from each will be analyzed accordingly. Reference line locations may be refined within the transmission line corridors throughout the NEPA process.

TransWest Express LLC (TransWest)	TransWest Express LLC is a wholly owned affiliate of The Anschutz Corporation (TAC), a privately held company based in Denver. Through its affiliates, TAC has been actively involved in the West for more than 75 years in the fields of ranching, agriculture, energy development and transmission, and more. TAC's activity and investments in the energy field reflect a strong commitment to responsibility developing and managing natural resources (TransWest 2012).
Trip	A single or one-direction vehicle movement with either the origin or the destination inside the study site.
Trona	A monoclinic mineral, grayish or yellowish hydrous sodium carbonate and bicarbonate, $Na_2CO_3 \cdot NaHCO_3 \cdot 2H_2$, occurring in dried or partly evaporated lake basins.
Turbidity	The state or condition of opaqueness or reduced clarity of a fluid, due to the presence of suspended in matter.
U.S. Army Corps of Engineers (USACE) Jurisdictional Wetlands	Wetlands that are regulated by the USACE under Section 404 of the CWA. Areas must exhibit three characteristics of wetlands (hydrology, hydrophytes, and hydric soils) and must be navigable, or hydrologically connected to navigable waters, in order to be classified as jurisdictional wetlands (USACE 1987). It is important to understand that some areas that function as wetlands ecologically, but exhibit only one or two of the three wetland characteristics, do not currently qualify as USACE jurisdictional wetlands, and thus activities in these wetlands are not regulated under the Section 404 program. In addition, artificial water conveyance systems constructed within upland areas (such as agricultural drainage ditches or converted cropland) may develop some wetland characteristics overtime, however, these areas are not considered as jurisdictional wetlands, as long as they are not located within historical wetland systems. Jurisdictional wetlands include **waters of the United States**.
U.S. Department of Agriculture, Forest Service (USFS)	A federal agency under the Department of Agriculture that manages 193 million acres of public land for multiple uses and benefits and for the sustained yield of renewable resources such as water, forage, wood, recreation, fish and wildlife habitat, wilderness areas, and archaeological, paleontological and historical sites.

U.S. Fish and Wildlife Service (USFWS)	A 1940 reorganization plan (54 Stat. 1232) in the Department of the Interior consolidated the Bureau of Fisheries and the Bureau of Biological Survey into one agency to be known as the Fish and Wildlife Service. The Bureau of Sport Fisheries and Wildlife was created as a part of the U.S. Fish and Wildlife Service in the Department of the Interior on November 6, 1956, by the Fish and Wildlife Act of 1956 (70 Stat. 1119). That act was amended on July 1, 1974, by Public Law 93-271 (88 Stat. 92) to, among other purposes, abolish the position of Commissioner of Fish and Wildlife and designate the Bureau as the U.S. Fish and Wildlife Service (USFWS 2010).
Understory	Foliage layer beneath the forest canopy. Young trees that are growing beneath the tall mature trees in a timber stand (Conway 1973).
Vegetation Communities	A combination of dominant plant species that live together in the same region or on the same landform.
Viewshed	As defined in the BLM Visual Resource Management Manual, viewshed refers to “the landscape that can be directly seen under favorable atmospheric conditions, from a viewpoint or along a transmission corridor.”
Visitor-day	An aggregate of 12 hours of recreation use by one or more individuals (BOR 2010).
Visual Contrast Rating (VCR)	A systematic process used by the Bureau of Land Management (BLM) to analyze potential visual impact of proposed projects and activities.
Visual Management System (VMS)	See **Scenery Management System**.
Visual Quality Objectives (VQO) (Forest Service)	Management standards that identify five degrees of alteration to the natural landscape based on the landscape’s diversity of natural features and the public’s concern for scenic quality.
Visual Resource Inventory (VRI) (BLM)	Visual Resource Inventory classes (I through IV) represent the relative value of the visual resources and provide the basis for considering visual values in the resource management planning process. VRI classes are the composite of scenic quality, sensitivity levels, and distance zones.

Visual Resource Management (VRM) System (BLM)	The BLM system identified four VRM Classes (I through IV) with specific management prescriptions for each class. The system is based on an inventory of the existing scenic quality, viewer sensitivity, and viewing distance zones. The management class for a given area is typically arrived at by comparing the scenic quality, visual sensitivity, and distance zone with the overall goals set forth for the area.
Volt	The international system unit of electrical potential and electromotive force—a measure of electrical “pressure”.
Voltage	The electrical potential difference between two points expressed in volts; the driving force that causes a current to flow in an electrical circuit.
Volume-to-Capacity Ratio	The ratio of flow rate to capacity for a transportation facility.
Waters of the United States	Broadly defined by statute, regulation, and judicial interpretation to include all waters that were, are, or could be used in interstate commerce such as rivers, streams (including ephemeral streams), reservoirs, lakes, and adjacent wetlands. The USACE Wetlands Delineation Manual dated January 1987 (USACE 1987) and its current supplements must be used to determine if an area has sufficient wetland characteristics to be a water of the United States.
Watershed	The area that drains to a common waterway.
Western Area Power Administration (Western)	Western, an agency of the U.S. Department of Energy (DOE), has been designated as a joint-lead federal agency for the environmental review of the TransWest Express Transmission Line Project.
West-wide Energy (WWE) Corridor	The designation of energy corridors, based on Section 368 of the Energy Policy Act of 2005, on federal lands in 11 western states, including Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
West-wide Energy Corridor Programmatic EIS	Considers 11 contiguous western states for the possible construction, operation, maintenance, and decommissioning and dismantling of energy infrastructure such as oil and gas pipelines and electric transmission lines. The states considered are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Wetlands	Defined for regulatory purposes as “Those areas that are inundated or saturated by surface or ground water (hydrology) at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation (hydrophytes) typically adapted for life in saturated soil conditions (hydric soils). Wetlands generally include swamps, marshes, bogs, and similar areas (CFR 328.3 and 40 CFR 232.2(r)).”
Wilderness Act of 1964	The Wilderness Act designated all previously existing Wild Areas, Canoe Areas, and Wilderness Areas as Wilderness. In 1964, these areas on national forests totaled 9.1 million acres and represented the entire National Wilderness Preservation System (USFS 2008).
Wilderness Area	An area formally designated by Congress as part of the National Wilderness Preservation System (BLM 2012d).
Wilderness Characteristics	These attributes include the area’s size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation. They may also include supplemental values (BLM 2012c).
Wilderness Study Area (WSA)	Areas with wilderness characteristics identified and designated through the inventory and study processes authorized by Section 603 of FLPMA, and prior to 2003, through the planning process authorized by Section 202 of FLPMA (BLM 2012c).
Winter range	Areas that are used by animals, primarily big game, during winter months when forage is scarce and snow is often deep.
Wire zone	A linear zone under the transmission wires, and extending 10 feet beyond them, maintained in vegetation cover less than 5 feet high.
Zoning	Regulations used to guide growth and development; typically involve legally adopted restrictions on uses and building sites in specific geographic areas to regulate private land use.

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