Chapter 2
PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the Applicant's Proposed Action to construct, operate, and maintain a 500-kV transmission line and ancillary facilities, including a description of right-of-way acquisition, transmission-line components, substations, communication system, access roads, geotechnical investigation required to inform the design and engineering of the B2H Project facilities, and construction activities to assist in understanding the types and extent of environmental effects that could result from the proposed B2H Project.

Also described in this chapter are the range of reasonable alternatives for the Proposed Action identified for detailed analysis, as required by Section 102(2)(E) of the NEPA (40 CFR 1502.14), including the No Action Alternative, which is the continuation of the existing condition or management and serves as a baseline for comparing the environmental effects of the B2H Project alternatives and alternatives considered but eliminated from detailed analysis. In addition, described are the approach used to conduct the process of analyzing and comparing the alternatives; results of the comparison of alternatives, including a description of the environmentally preferable action alternative that emerged from the analyses; description of the Applicant's Proposed Action Alternative route; and description of the Agency Preferred Alternative.

2.1.1 SUMMARY OF CHANGES FROM THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Between the Draft EIS and Final EIS, revisions were made to the Applicant's Proposed Action, route-variation options were developed to be located closer to (a minimum of 250 feet from) existing transmission lines, and localized route-variation options were developed in some of the segments. These include the following:

- The Applicant changed the northern terminus of the Proposed Action from the proposed Grassland or proposed Horn Butte Substation to the proposed Longhorn Substation and proposes to route the 500-kV transmission line along the west side of Bombing Range Road, which is on the NWSTF Boardman along the west side of the eastern boundary of the military facility (Section 2.1.1.1), to allow for construction of the proposed 500-kV line. A portion of an existing BPA 69-kV transmission line displaced by the 500-kV transmission line would have to be removed.
- The BLM requested colocation of the Draft EIS Agency Preferred Alternative route for the proposed transmission line closer to existing transmission lines (Section 2.1.1.2).
- Localized route-variation options were developed (Section 2.1.1.3) based on comments received between the Draft EIS and Final EIS.

As stated above, a part of the Applicant's Proposed Action is to remove the portion of BPA's 69-kV transmission line, along the west side of Bombing Range Road that would be displaced by the proposed 500-kV transmission line. Although not part of the Applicant's Proposed Action, if an alternative route along the west side of Bombing Range Road (Segment 1) is selected, the 69-kV line may be relocated. The additional action of replacing the BPA 69-kV line is a connected action under the NEPA, the effects of which are analyzed and addressed in the EIS. This additional action is addressed in Section 2.5.2.1 and the potential effects of this action are reported throughout Chapter 3.

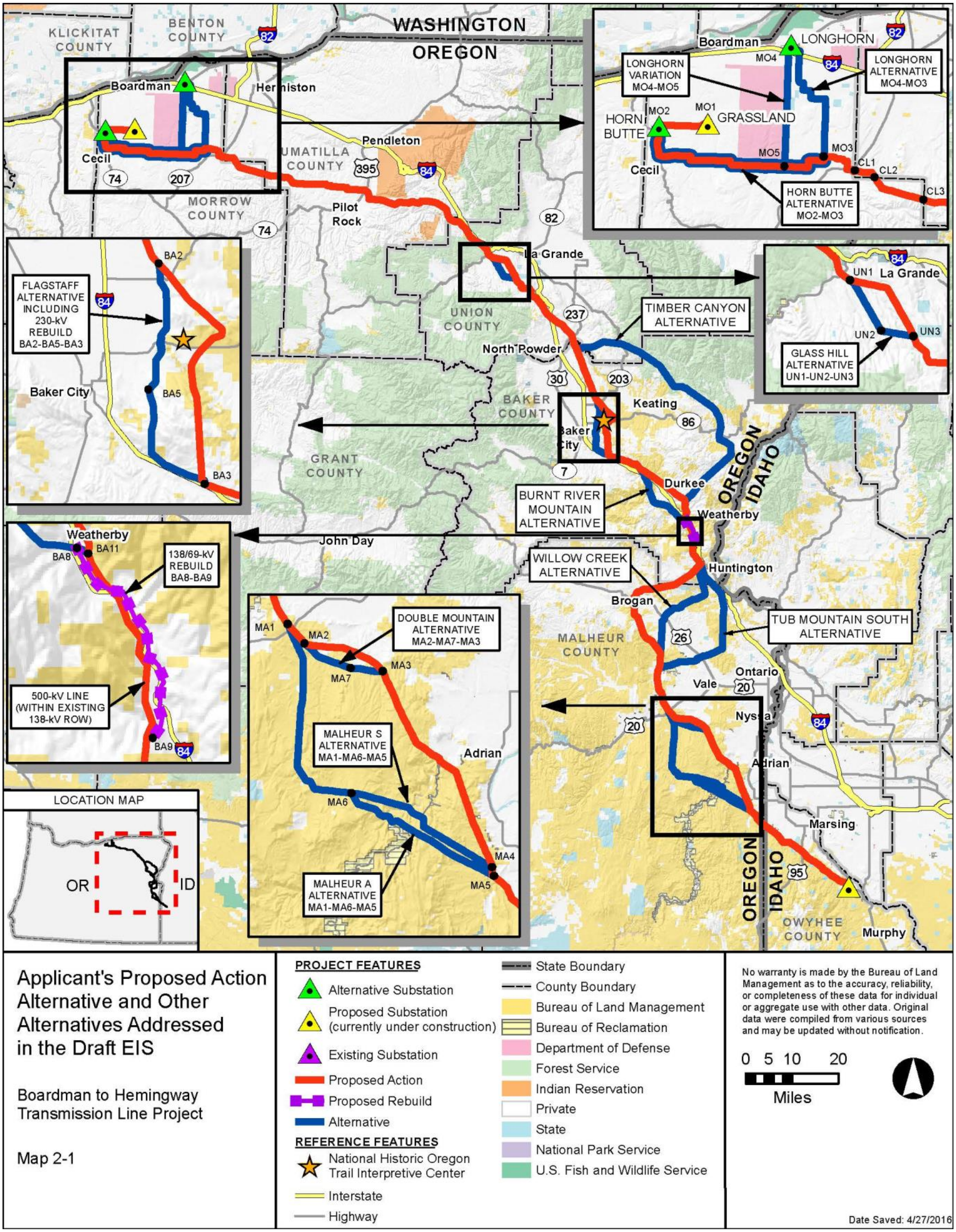
These revisions and route-variation options are described below. The alternative routes addressed in the Draft EIS are shown on Map 2-1, and the alternative routes addressed in this Final EIS are shown on Maps 2-2a and 2-2b.

2.1.1.1 Change in Applicant's Proposed Action

In order for the B2H Project to meet its objective of adding approximately 1,000 megawatts of bi-directional capacity between the Pacific Northwest and Intermountain West regions, the point of interconnection at the northern terminus must provide sufficient capacity to (1) transfer an additional 1,050 MW of power from the BPA 500-kV transmission system in the Pacific Northwest west-to-east across the Idaho-Northwest transmission path, (2) transfer an additional 1,000 MW of power east-to-west across the Idaho-Northwest transmission path, and (3) allow for actual power flows on the B2H Project transmission line of up to approximately 1,500 MW, accounting for variations in actual power flows of the various transmission lines comprising the Idaho-Northwest transmission path.

When Idaho Power began the federal permitting process for the B2H Project in 2007, other transmission development projects were being proposed in the Pacific Northwest that influenced Idaho Power's northern terminus location options for the B2H Project; in particular, Portland General Electric's (PGE) Cascade Crossing 500-kV Project. In 2008, the Applicant and PGE executed a Memorandum of Understanding concerning Boardman area transmission development, with the intent of sharing development plans and developing facilities collaboratively to assist each company in fulfilling their respective service and system-reliability obligations. The proposed Grassland Substation was contemplated as an interconnection point between the two projects that could help each company with their respective project objectives (Map 2-1). The proposed Horn Butte Substation was introduced as an alternative location to connect to the Cascade Crossing 500-kV Project.

However, since the NEPA process was initiated for the B2H Project, the transmission-development landscape has changed. Several of the development projects under consideration during the time of original application subsequently have been cancelled. Notably, in 2013, PGE indefinitely suspended the Cascade Crossing Project.


WASHINGTON
OREGON
KLICKITAT COUNTY
BENTON COUNTY
MORROW COUNTY
UMATILLA COUNTY
UNION COUNTY
BAKER COUNTY
GRANT COUNTY
MALHEUR COUNTY
OWYHEE COUNTY
OREGON
IDAHO
Boardman
Hermiston
Cecil
Pendleton
Pilot Rock
La Grande
North Powder
Keating
Baker City
Durkee
Weatherby
Huntington
Brogan
Vale
Ontario
Nyssa
Adrian
Marsing
Murphy
John Day
LONGHORN
HORN BUTTE
GRASSLAND
LONGHORN VARIATION MO4-MO5
LONGHORN ALTERNATIVE MO4-MO3
HORN BUTTE ALTERNATIVE MO2-MO3
MO1
MO2
MO3
MO4
MO5
CL1
CL2
CL3
TIMBER CANYON ALTERNATIVE
GLASS HILL ALTERNATIVE UN1-UN2-UN3
UN1
UN2
UN3
FLAGSTAFF ALTERNATIVE INCLUDING 230-kV REBUILD BA2-BA5-BA3
BA2
BA5
BA3
BURNT RIVER MOUNTAIN ALTERNATIVE
WILLOW CREEK ALTERNATIVE
TUB MOUNTAIN SOUTH ALTERNATIVE
138/69-kV REBUILD BA8-BA9
500-kV LINE (WITHIN EXISTING 138-kV ROW)
BA8
BA11
BA9
DOUBLE MOUNTAIN ALTERNATIVE MA2-MA7-MA3
MALHEUR S ALTERNATIVE MA1-MA6-MA5
MALHEUR A ALTERNATIVE MA1-MA6-MA5
MA1
MA2
MA3
MA4
MA5
MA6
MA7
LOCATION MAP
OR
ID
Applicant's Proposed Action Alternative and Other Alternatives Addressed in the Draft EIS
Boardman to Hemingway Transmission Line Project
Map 2-1
PROJECT FEATURES
Alternative Substation
Proposed Substation (currently under construction)
Existing Substation
Proposed Action
Proposed Rebuild
Alternative
REFERENCE FEATURES
National Historic Oregon Trail Interpretive Center
Interstate
Highway
State Boundary
County Boundary
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Forest Service
Indian Reservation
Private
State
National Park Service
U.S. Fish and Wildlife Service
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
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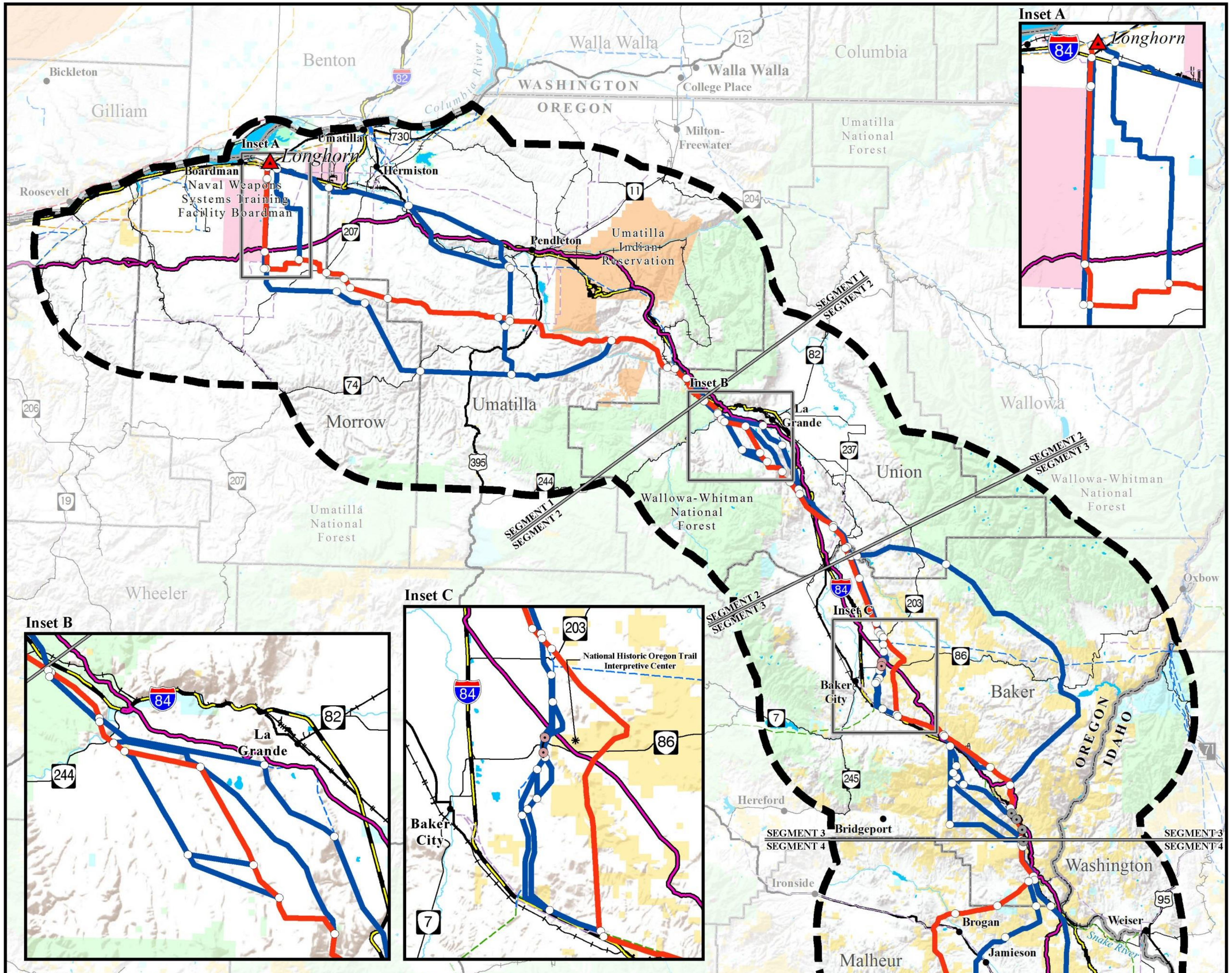

Map 2-2a

Alternative Routes Analyzed for the Final EIS (Northern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Line
- Flagstaff 230-kV Rebuild (Inset C)
- Double-circuit 138/69-kV Rebuild (Inset D)

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Other Federal
- State Land
- Private Land

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007,
Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
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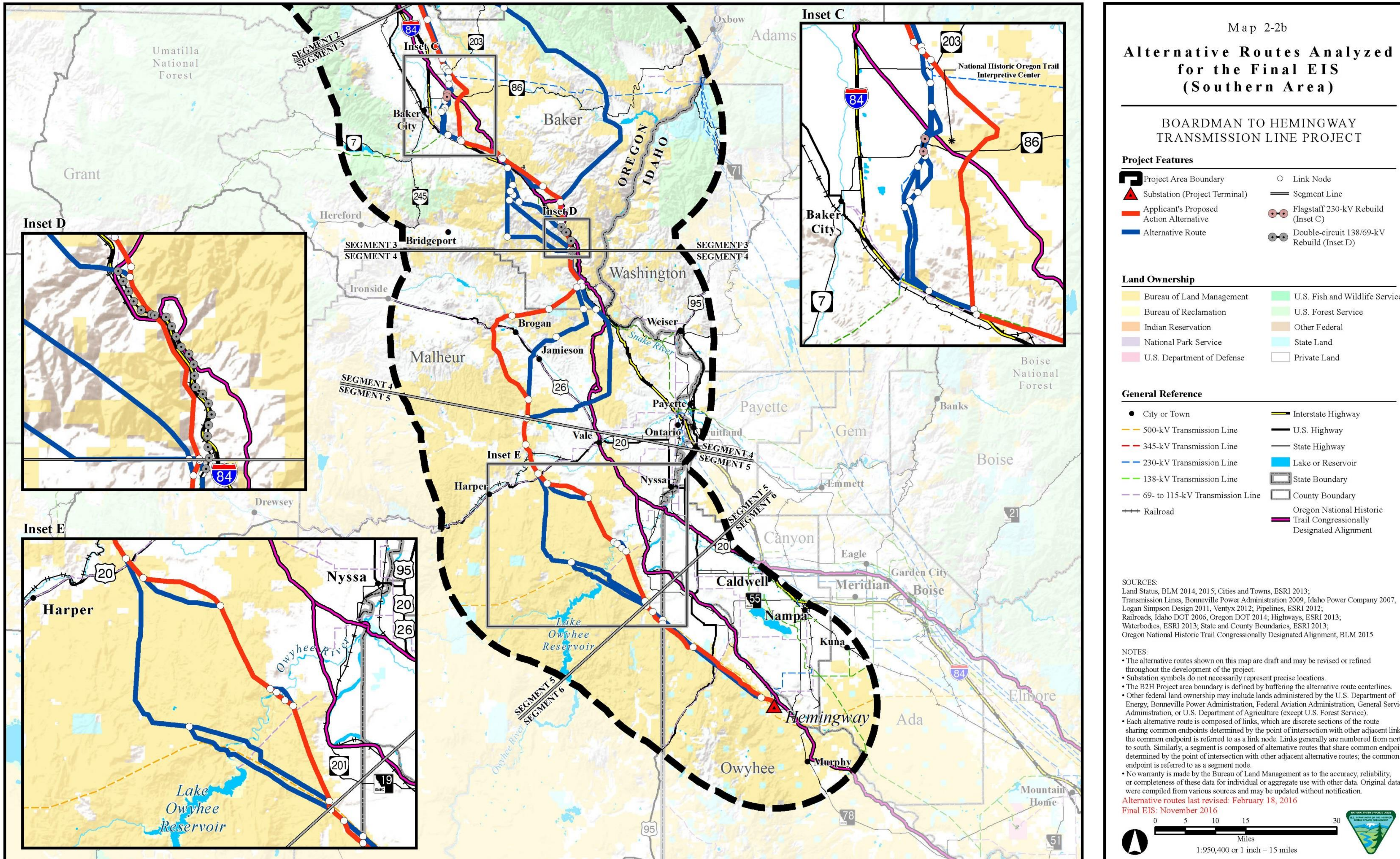
Map 2-2b
Alternative Routes Analyzed for the Final EIS (Southern Area)
BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT
Project Features
Project Area Boundary
Substation (Project Terminal)
Applicant's Proposed Action Alternative
Alternative Route
Link Node
Segment Line
Flagstaff 230-kV Rebuild (Inset C)
Double-circuit 138/69-kV Rebuild (Inset D)
Land Ownership
Bureau of Land Management
Bureau of Reclamation
Indian Reservation
National Park Service
U.S. Department of Defense
U.S. Fish and Wildlife Service
U.S. Forest Service
Other Federal
State Land
Private Land
General Reference
City or Town
500-kV Transmission Line
345-kV Transmission Line
230-kV Transmission Line
138-kV Transmission Line
69- to 115-kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Lake or Reservoir
State Boundary
County Boundary
Oregon National Historic Trail Congressionally Designated Alignment
SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007,
Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015
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Final EIS: November 2016
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Miles
1:950,400 or 1 inch = 15 miles
Inset C
National Historic Oregon Trail Interpretive Center
Baker City
Inset D
Inset E
Harper
Nyssa
Owyhee River
Lake Owyhee Reservoir
Umatilla National Forest
Grant
Baker
Hereford
Bridgeport
Ironside
Brogan
Jamieson
Malheur
Washington
Weiser
Payette
Ontario
Vale
Nyssa
Drewsey
Caldwell
Nampa
Kuna
Meridian
Garden City
Boise
Eagle
Emmett
Gem
Canyon
Banks
Boise National Forest
Ada
Elmore
Hemingway
Murphy
Owyhee
Mountain Home
Oxbow
Adams
OREGON
IDAHO
Snake River
SEGMENT 2
SEGMENT 3
SEGMENT 4
SEGMENT 5
SEGMENT 6

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In the absence of the Cascade Crossing Project, neither the proposed Grassland Substation nor alternative Horn Butte Substation would provide the required approximate 1,000 MW of bi-directional capacity and up to 1,500 MW of actual power-flow capability. Therefore, the proposed Grassland and Horn Butte substations and alternative routes to these substations as set forth in the B2H Project Draft EIS, do not meet the B2H Project objectives. The Applicant is now proposing the remaining Longhorn Substation, which was analyzed in the Draft EIS, as the northern terminus.

The Applicant's objective of terminating at the Longhorn Substation is based on more than electrical connectivity. The site of the Longhorn Substation provides flexibility for commercially advantageous development opportunities. The Longhorn Substation is strategically located near existing generation sources that comprise potential transmission customers or generator service providers for the permitting partners.

In the Draft EIS for the B2H Project, the BLM considered four alternative route-variation options near the NWSTF Boardman property: (1) Grassland Substation route; (2) Horn Butte Substation route; 3) Longhorn Alternative; and (4) Longhorn Variation (on the east side of Bombing Range Road). In comments on the Draft EIS, local landowners, local governments, and the Oregon Department of Agriculture criticized the Longhorn Alternative and Longhorn Variation, expressing concern about the potential impacts on irrigated agriculture and the related economic effects. A number of commenters advocated for a route-variation option on the west side of Bombing Range Road, which would be on the eastern border of the NWSTF Boardman, federal land withdrawn for military use.

The Applicant submitted an application, dated June 22, 2015, to the Navy requesting an easement that would repurpose the area along the eastern boundary of the NWSTF Boardman on the west side of Bombing Range Road, currently occupied by a 69-kV transmission line, for the construction, operation, and maintenance of the B2H Project transmission line. BPA, a permitting partner on the B2H Project, owns and operates the 69-kV transmission line (which serves Columbia Basin Electric Cooperative in southern Morrow County) pursuant to a use agreement with the Navy. The BPA would cooperate with the Applicant to terminate its existing use agreement with the Navy and remove the 69-kV transmission line and construct the B2H Project in place of the 69-kV transmission line. The location and width of the Idaho Power easement would be the same as that provided in BPA's existing use agreement for the 69-kV transmission line; that is, a 90-foot-wide use area. The Applicant is proposing a modified transmission-line structure type, which would be no taller than 100 feet to mitigate potential impacts; that is, minimize interference with the military operations of the NWSTF Boardman. Umatilla Electric Cooperative (UEC), which owns and operates a 115-kV transmission line on private property on the east side of Bombing Range Road, would cooperate with BPA to help BPA continue to provide electrical service to its customers served by the displaced 69-kV transmission line. This is considered a connected action under the NEPA. Description of the 69-kV line relocation is presented in Section 2.5.2.1 and analysis of the action is included throughout Chapter 3.

The route-variation option west of Bombing Range Road was not an alternative in the Draft EIS, but is within the study corridor included in the Draft EIS affected environment sections; therefore, the EIS does not require supplementation. It has been added as the northern portion of the Applicant's

Proposed Action Alternative route. Map 2-3 shows the Applicant's revised Proposed Action in the northern portion of Segment 1.

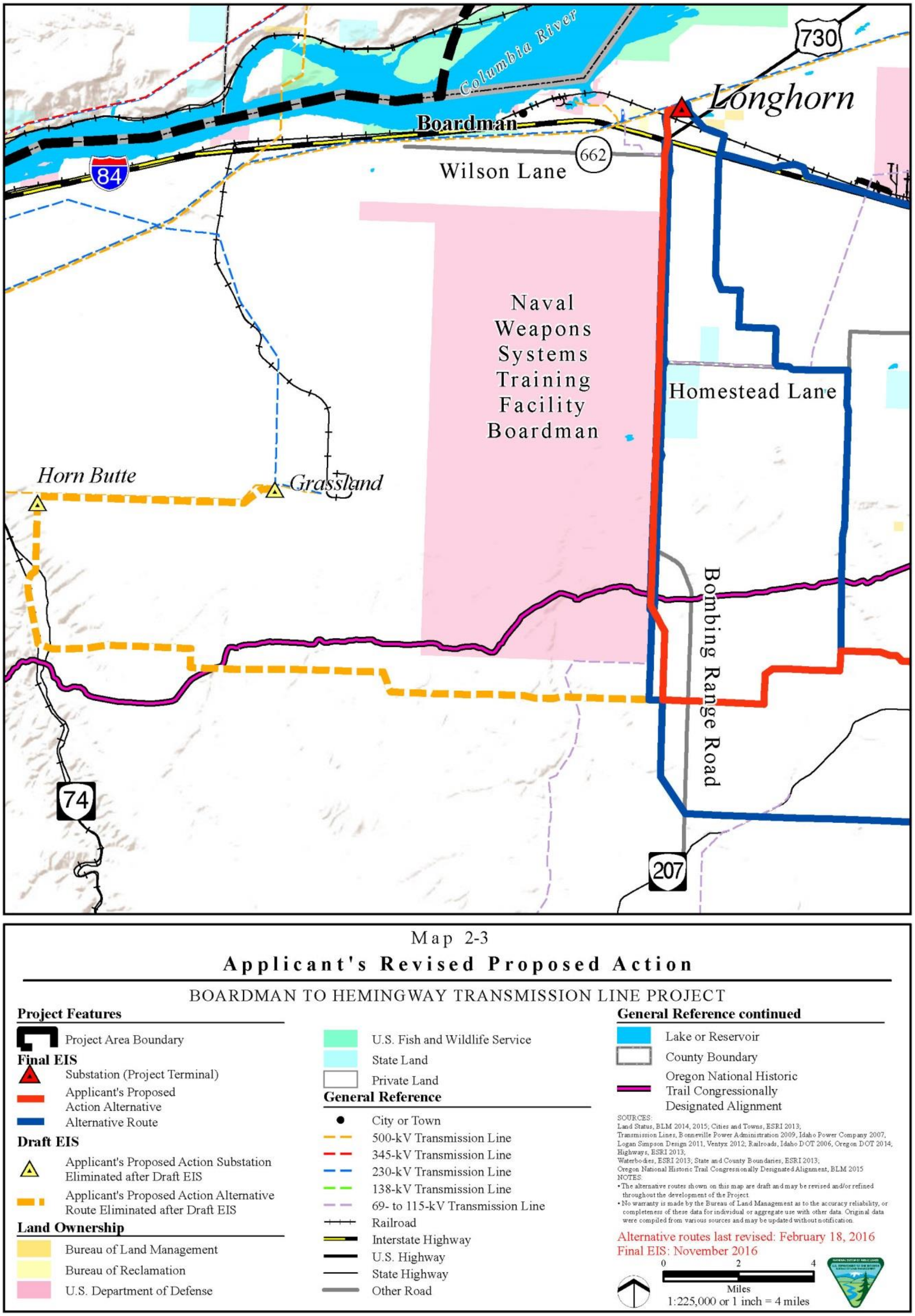
2.1.1.2 Colocation of Transmission Lines

The Draft EIS presented alternative routes for the B2H Project that were sited with a separation distance of approximately 1,500 feet, where feasible, from existing transmission lines. Between the Draft EIS and Final EIS, the BLM requested that the Draft EIS Agency Preferred Alternative route be colocated closer to existing transmission lines. This section explains the background for establishing the initial 1,500-foot separation and the reason the BLM requested the reduction in the separation distance. Maps 2-4a and 2-4b show the areas where colocated route variations were developed.

In recent decades, significant transmission-line outages resulted in increased regulation aimed at the operation, physical security, and overall reliability of the nation's transmission systems. The FERC was given the mandate by Congress to oversee that mandatory reliability standards are implemented. Under the direction of the FERC, the NERC implemented and enforces more than 100 standards to promote reliability. Also, NERC has authority over eight regional coordinating councils to oversee system reliability in each region. The Western Electricity Coordinating Council is the regional coordinating council responsible for overseeing the Western Interconnection (i.e., electrical grid in the western U.S.) (and the immediate regulatory body under which the Applicant must operate). The NERC and Western Electricity Coordinating Council standards and criteria require transmission providers to meet certain system-performance requirements during outages of multiple transmission line and require risk assessments for impacts on the system due to extreme events, such as loss of multiple transmission lines and entire transmission corridors.

Right-of-way and transmission-line-separation distances[1] for all transmission lines (existing and proposed) in the U.S. should comply with NERC reliability standards. Transmission lines in the Western Electricity Coordinating Council system also are required to comply with Western Electricity Coordinating Council reliability criteria.

[1] "Separation distance" refers to the minimum separation between the centerline of one transmission line structure and the centerline of an adjacent centerline of an adjacent transmission line structure where multiple transmission lines follow parallel routes and are aligned structure to structure.


730
Columbia River
Longhorn
Boardman
84
662
Wilson Lane
Naval Weapons Systems Training Facility Boardman
Homestead Lane
Horn Butte
Grassland
Bombing Range Road
74
207
Map 2-3
Applicant's Revised Proposed Action
BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT
Project Features
Project Area Boundary
Final EIS
Substation (Project Terminal)
Applicant's Proposed Action Alternative
Alternative Route
Draft EIS
Applicant's Proposed Action Substation Eliminated after Draft EIS
Applicant's Proposed Action Alternative Route Eliminated after Draft EIS
Land Ownership
Bureau of Land Management
Bureau of Reclamation
U.S. Department of Defense
U.S. Fish and Wildlife Service
State Land
Private Land
General Reference
City or Town
500-kV Transmission Line
345-kV Transmission Line
230-kV Transmission Line
138-kV Transmission Line
69- to 115-kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Other Road
General Reference continued
Lake or Reservoir
County Boundary
Oregon National Historic Trail Congressionally Designated Alignment
SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013;
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NOTES:
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016
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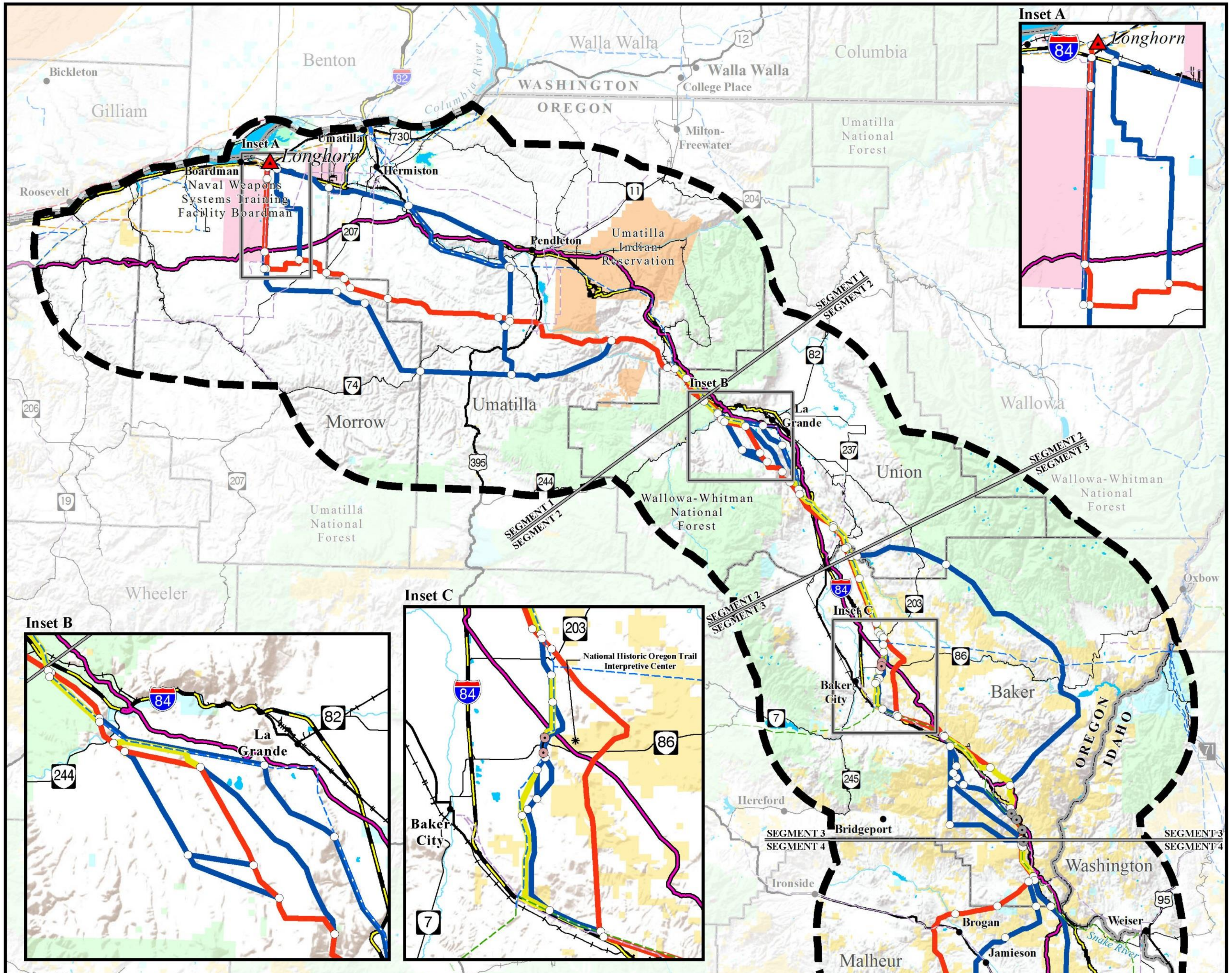

Map 2-4a

Colocation Variations (Northern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Colocation Variation
- Link Node
- Segment Line
- Flagstaff 230-kV Rebuild (Inset C)
- Double-circuit 138/69-kV Rebuild (Inset D)

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Other Federal
- State Land
- Private Land

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013;
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Final EIS: November 2016

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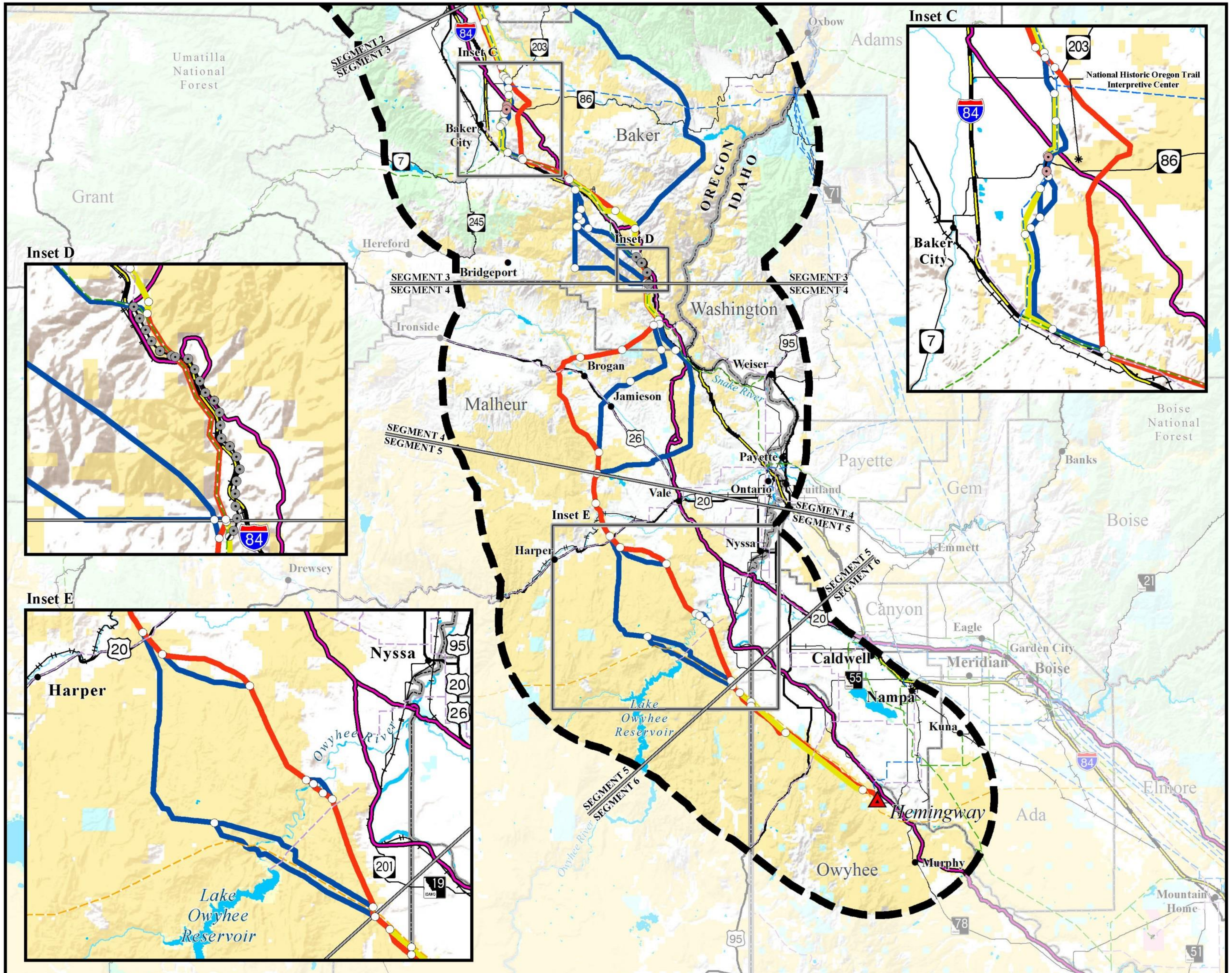

Map 2-4b

Colocation Variations (Southern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Colocation Variation
- Link Node
- Segment Line
- Flagstaff 230-kV Rebuild (Inset C)
- Double-circuit 138/69-kV Rebuild (Inset D)

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Other Federal
- State Land
- Private Land

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
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- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
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Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
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The Western Electricity Coordinating Council reliability criteria recognize the unique nature of the Western Electricity Coordinating Council system, where there are several instances of multiple long-distance transmission lines running parallel within a corridor and transferring power from remote generation locations to distant load centers. This differs from some other interconnections in the U.S. where load centers are dispersed between generation sources and transmission lines are relatively short. These long-distance transmission lines typically are 345-kV or greater and carry a large amount of power (often referred to as “bulk” power). The presence of long-distance transmission lines implies less redundancy in the system because these long-distance transmission lines could significantly affect the reliability of the power system and could result in cascading outages and loss of load. Therefore, more safeguards against outage of these lines—such as robust construction and frequent maintenance, comprehensive and failsafe protection systems, and outage mitigation methods (such as remedial action schemes)—are designed and implemented throughout the Western Electricity Coordinating Council system.

In 2008, the Western Electricity Coordinating Council established system-performance criteria that required all transmission lines within a common corridor to be subject to performance requirements imposed by the NERC. Common corridors are defined as “contiguous right of way or two parallel rights of way with structure centerlines separation less than the longest span length of the two transmission circuits at the point of separation or 500 feet, whichever is greater, between the transmission circuits. This separation requirement does not apply to the last five spans of the transmission circuits entering into a substation.” Since the typical span for a 500-kV transmission line is approximately 1,500 feet, the Applicant incorporated as part of its transmission-line siting criteria a separation of approximately 1,500 feet between its proposed transmission line and existing lines. In 2012, the Western Electricity Coordinating Council retired the definition of common corridor and introduced Adjacent Transmission Circuits defined as “two transmission circuits with separation between their centerlines less than 250 feet at the point of separation” (Western Electricity Coordinating Council 2013).

From the perspective of the land-managing agencies, it is generally accepted that consolidating facilities minimizes environmental and land-use impacts (e.g., share access roads to minimize surface disturbance, avoid additional habitat fragmentation, reduce visual effects). In accordance with the FLPMA each right-of-way grant must contain terms and conditions that will, among other things, “minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise protect the environment.” Congress addressed the issue of rights-of-way in utility corridors in Section 503 of the FLPMA. Section 503 states that the Secretary of the Interior will designate corridors to minimize adverse environmental impacts and Executive Order 13213 requires the BLM to emphasize rights-of-way planning and corridor designations. The overall objective is to continue to make federal administered lands available for needed rights-of-way where consistent with national, state, and local plans, and use common rights-of-way to minimize environmental impacts and proliferation of separate rights-of-way.

Given the FLPMA preference to consolidate linear facilities to minimize proliferation of separate rights-of-way, the BLM determined it appropriate to request that the separation distance be reduced. Late in

2014, the BLM requested the Applicant colocate the proposed transmission line, along the Draft EIS Agency Preferred Alternative route, closer to existing transmission lines where possible.

In early 2015, the Applicant reviewed the routing and identified variations to colocate the proposed line closer to existing transmission lines and reviewed the collocated sections of alternative route with the BLM.

However, in a letter from the Applicant dated August 21, 2015, the Applicant stated that (1) the Applicant opposes BLM's route variation providing for an approximately 250-foot and not a 1,500-foot separation distance between adjacent lines, (2) the 250-foot separation distance would not be consistent with the Applicant's objectives for the B2H Project, (3) the separation distance was addressed as part of the right-of-way pre-application meetings and it would be arbitrary and capricious to require a new standard later in the B2H Project, and (4) BLM does not have the authority to dictate separation distances on private or state lands. In the letter, the Applicant explains that Western Electricity Coordinating Council System Performance Criterion TPL-001-WECC-CRT-2.1 identifies certain circumstances whereby electrical utilities must conduct system-reliability simulations and assessments.

These assessment requirements are triggered if, among other things, there are adjacent transmission circuits that share a common right-of-way for a total of more than 3 miles, that are separated by less than 250 feet between centerlines, and that both operate at greater than or equal to 300 kilovolts. Further, the Applicant explains that there is no NERC or Western Electricity Coordinating Council standard or optimal separation distance. Utilities are expected to use their experience and judgment in siting their transmission system in proximity to existing systems. At a minimum, new transmission systems must avoid common node failures, which include the loss of two parallel transmission lines in proximity to each other. Common node failures can result from, among other things, a shield wire from one line being dragged into the adjacent line, high winds, dust storms, ice storms, blizzards, landslides, earthquakes, vandalism, and equipment failure. The NERC and Western Electricity Coordinating Council standards leave the responsibility to the transmission line owner to avoid common node failures and to ensure reliable delivery of electrical services.

The BLM considered the Applicant's statements in its August 21, 2015 letter, the requirements of FLPMA, and comments on the Draft EIS encouraging colocation closer to existing lines, and decided to carry forward and analyze in detail in the Final EIS both the Applicant's originally proposed alignment approximately 1,500 feet from existing transmission lines and the alignment collocated closer to (no less than 250 feet away from) existing transmission lines.

2.1.1.3 Recommended Route-Variation Options

A number of comments on the Draft EIS offered recommendations for local route-variation options as variations of portions of alternative routes within the B2H Project area. All of the recommended route-variation options and whether the route-variation option has been carried forward in the Final EIS or was considered but eliminated from detailed analysis in the Final EIS are described below. The recommended route-variation options carried forward in the Final EIS are shown on Map 2-5. Section 2.5.4 describes the recommendations for route-variation options that were considered but eliminated from detailed analysis in the Final EIS. Maps 2-8a and 2-8b show the recommended route variations that were considered but eliminated from detailed analysis in the Final EIS.

Segment 1—Morrow-Umatilla

Slatt Substation Route-Variation Option

The Columbia-Snake River Irrigators Association, Oregon Department of Agriculture, Morrow County, City of Boardman, and businesses (Windy River, Hale Companies, Boardman Tree Farm, Pasco Farming, Inc.) recommended a route-variation option that would extend the Horn Butte Substation Alternative route, south of the Naval Weapons Systems Training Facility, approximately an additional 10 miles to the west to connect with the existing BPA Slatt 500-kV Substation (refer to Map 2-8a). The intent of the recommended alternative route was to mitigate impacts on irrigated agricultural lands associated with alternative routes to the Longhorn Substation and it was suggested as an alternative for connecting into the Mid-Columbia grid.

In a letter dated July 23, 2015, BPA, the sole owner of the Slatt Substation, informed the BLM that the Slatt Substation has no open 500-kV bays and there are “severe physical constraints” with expanding the substation to accommodate the B2H Project. Also, BPA has not determined that a joint ownership structure, including an open-bus concept, would be acceptable or even feasible for existing BPA substations, including the Slatt Substation Because the substation is wholly owned by BPA, BPA’s existing policy and rate schedules would require that BPA charge Idaho Power Company and PacifiCorp for use of the substation (which would be passed onto the rate payers).

The BLM reviewed the recommended route-variation option and, based on BPA’s explanation that it is technically and economically not feasible and it would not meet the interests and objectives of the Applicant and its partners, the BLM did not carry it forward for detailed analysis in the Final EIS (Section 2.5.4.3).

West of Bombing Range Road Route-Variation Option

Idaho Power, Oregon Department of Land Conservation and Development, Oregon Department of Agriculture, Columbia-Snake River Irrigators Association, businesses (Windy River; Hale Companies; Boardman Tree Farm; Pasco Farming. Inc.); Westland Enterprises LLC; Terra Poma Land LLC; Homestead Farms, Inc.; Pacific Northwest Generating Cooperative, UEC) and individuals recommended a routing of the transmission line on the west side of Bombing Range Road on the

NWSTF Boardman. This routing-variation is part of the Applicant's change to its Proposed Action and is analyzed in the Final EIS (Section 2.5.2.1).

Parallel Interstate 84/Existing 23-kV Transmission Line Route-Variation Options

Umatilla County, WildLands Defense; a consortium letter from OCTA, Hells Canyon Preservation Council, Oregon Wild, and WildEarth Guardians, Glass Hill Coalition, Elk Song Ranch; and several individuals recommended a route-variation option that would parallel Interstate 84 in Umatilla County and/or parallel existing 230-kV transmission lines. The intent is to reduce impacts on privately owned lands and consolidate utilities to avoid proliferation of utility corridors in this area. The BLM asked Idaho Power to develop a route variation colocated with Interstate 84 and/or the existing 230-kV transmission lines. At the BLM's request for an alternative route variation paralleling Interstate 84 and/or the existing 230-kV transmission lines, the Applicant developed four options that would be responsive to Draft EIS comments to colocate with the Interstate 84 or the existing 230-kV transmission lines. The options are described below.

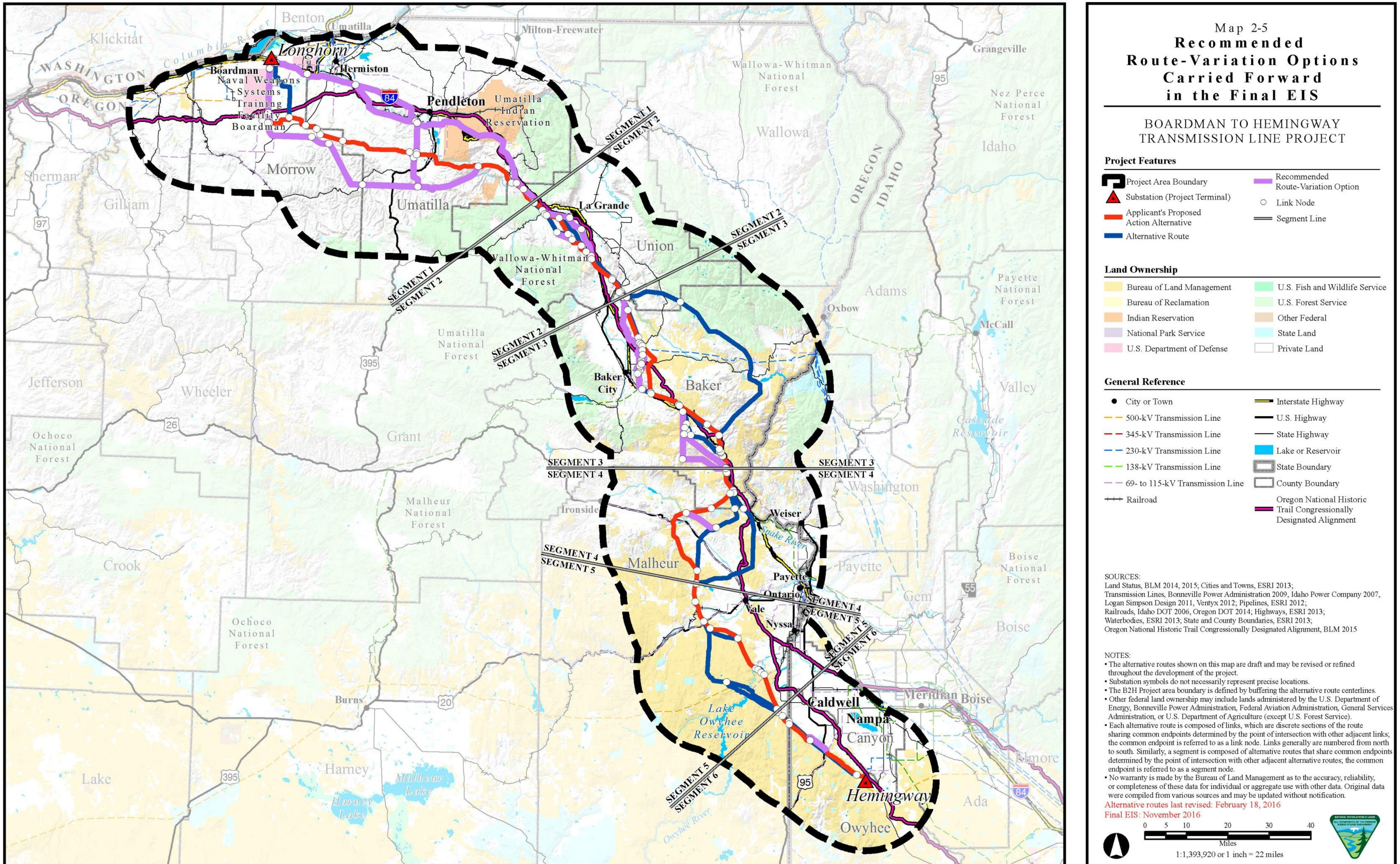
Route-Variation Option 1: From the Longhorn Substation, Option 1, parallels Interstate 84 to west of Pendleton, where it turns south and east to go around the community of Pendleton, parallels an existing transmission line to Interstate 84 and continues to parallel the transmission line to the southeast through the mountainous area of the Umatilla Indian Reservation and then roughly parallel to Interstate 84 to the Hilgard area.

Route-Variation Option 2: From the Longhorn Substation, Option 2 is similar to Option 1, but, in the area of Stanfield, Option 2 heads southeast to parallel an existing transmission line to the area of Rieth and then is the same as Option 1, including crossing the Umatilla Indian Reservation, to the Hilgard area.

Route-Variation Option 3: From the Longhorn Substation, Option 3 is the same as Option 1 to the area southeast of Rieth, where it continues to the south, then heads east, skirting the Umatilla Indian Reservation over to the area of Kamela where the route variation then parallels Interstate 84.

Route-Variation Option 4: From the Longhorn Substation, Option 4 is the same as Option 2 to the area south of Rieth, where it continues south and is the same as Option 3.

Options 1 and 2 cross the Umatilla Indian Reservation, and were considered but eliminated from detailed analysis, as explained in Section 2.5.4.3. Option 3 and 4 are addressed as variations along the Interstate 84 Alternative route (Section 2.5.2.1).


Map 2-5
Recommended Route-Variation Options Carried Forward in the Final EIS
BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT
Project Features
Project Area Boundary
Substation (Project Terminal)
Applicant's Proposed Action Alternative
Alternative Route
Recommended Route-Variation Option
Link Node
Segment Line
Land Ownership
Bureau of Land Management
Bureau of Reclamation
Indian Reservation
National Park Service
U.S. Department of Defense
U.S. Fish and Wildlife Service
U.S. Forest Service
Other Federal
State Land
Private Land
General Reference
City or Town
500-kV Transmission Line
345-kV Transmission Line
230-kV Transmission Line
138-kV Transmission Line
69- to 115-kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Lake or Reservoir
State Boundary
County Boundary
Oregon National Historic Trail Congressionally Designated Alignment
SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015
NOTES:
• The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
• Substation symbols do not necessarily represent precise locations.
• The B2H Project area boundary is defined by buffering the alternative route centerlines.
• Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
• Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
• No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
Alternative routes last revised: February 18, 2016
Final EIS: November 2016
0 5 10 20 30 40
Miles
1:1,393,920 or 1 inch = 22 miles
WASHINGTON
OREGON
IDAHO
Longhorn
Hemingway
Boardman Naval Weapons Systems Training Facility
Umatilla Indian Reservation
Wallowa-Whitman National Forest
Umatilla National Forest
Malheur National Forest
Ochoco National Forest
Payette National Forest
Boise National Forest
Nez Perce National Forest
Pendleton
La Grande
Baker City
Ontario
Caldwell
Nampa
Boise
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4
SEGMENT 5
SEGMENT 6

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Umatilla South Route-Variation Option

In a memorandum, dated September 11, 2015, Umatilla County requested that the BLM analyze a route-variation option that routes the transmission line approximately 10 miles south of the east-west portion of the Applicant's Proposed Action Alternative route in Segment 1. In January 2016, Umatilla and Morrow counties submitted a second request to the BLM to extend the route-variation option farther to the west and connect with the route-variation option west of Bombing Range Road. The intent of this route-variation option was to avoid existing agricultural lands. The Umatilla South route-variation option is incorporated as a segment of alternative routes in Segment 1 (Section 2.5.2.1).

Segment 2—Blue Mountains

Mill Creek Route-Variation Option

The Glass Hill Coalition, Elk Song Ranch, and individuals in Union County requested a route-variation option that would head east from the Applicant's Proposed Action Alternative (at the eastern boundary of the Wallowa-Whitman National Forest) to parallel an existing transmission line north of Morgan Lake, then south east paralleling the existing 230-kV transmission line to the point where it rejoins the Applicant's Proposed Action Alternative route north of Tamarack Mountain. The intent of this route-variation option is to reduce impacts on privately owned land and consolidate utilities to avoid proliferation of utility corridors in this area. In January 2016, Union County coordinated with the BLM and Idaho Power to adjust the route-variation options to avoid residences in proximity to the community of La Grande. In spring 2016, the BLM requested input from the cooperating agencies on the preliminary Agency Preferred Alternative. As A result, Union County confirmed this route-variation option as its preferred alternative. The Mill Creek route-variation option is addressed as part of the Mill Creek Alternative route (Section 2.5.2.2).

Glass Hill Route-Variation Option

Comments on the Draft EIS recommended a variation of the Glass Hill Alternative. The Glass Hill Alternative spans the canyons of Graves Creek, Little Rock Creek, Rock Creek, and then onto the high elevation of Cowboy Ridge. The recommended route-variation option would move the route approximately 2.5 miles west of Cowboy Ridge, which would avoid the spring, summer, and fall habitat of a large concentration of elk; avoid the high elevation of Cowboy Ridge, an ecological area unique to the Blue Mountain Province; further reduce potential views of a transmission line from the Morgan Lake recreation area; and move the route into an area with better road access thereby reducing the miles of new roads needed for the B2H Project. The Glass Hill route-variation option is addressed as a variation of the Glass Hill Alternative route (Section 2.5.2.2).

Segment 3—Baker Valley

Parallel Interstate 84 (Baker County) Route-Variation Option

The Oregon Department of Fish and Wildlife recommended a route-variation option intended to avoid Greater Sage-Grouse Priority Habitat Management Area (PHMA) by closely paralleling Interstate 84 from Oregon Highway 203 to the end of Segment 3. The intent of this route variation was to mitigate impacts on Greater Sage-Grouse PHMA. Because of other constraints along this route-variation option (e.g., proximity to Baker Municipal Airport, crosses through airspace associated with the airport), it was considered but eliminated from detailed analysis (Section 2.5.4.3).

Sunnyslope Route-Variation Option

Commenters recommended a route-variation option that is roughly parallel to and east of the Draft EIS Flagstaff Alternative (now Flagstaff A Alternative) east of Baker Municipal Airport, for approximately 8 miles. The intent of this route variation is to locate the alignment closer to section lines to reduce impacts on land owners and agricultural operations. Later in January 2016, the BLM coordinated with Baker County to adjust route-variation options in that area to avoid crossing Greater Sage-Grouse PHMA, a high point in proximity to the National Historic Oregon Trail Interpretive Center (NHOTIC) from which a 500-kV transmission line would be visible, crossing in the proximity of an intact segment of Oregon National Historic Trail, and minimize crossing agricultural lands. The Sunnyslope route-variation option is addressed as a segment of an alternative route in Segment 3 (Section 2.5.2.3).

Durkee Route-Variation Option

In comments on the Draft EIS, Baker County recommended a route-variation option, with a map provided, that would begin farther south than the Burnt River Mountain Alternative (near Dixie, Oregon) and extend farther west and then north to join the Burnt River Mountain Alternative approximately 6 miles northwest of Durkee. The intent of this route-variation option was to mitigate impacts on agricultural land uses and privately owned lands, socioeconomics, and high-value soils in and around the community of Durkee. Generally, the requested Durkee route-variation option follows section lines and crosses both private lands and BLM-administered land. Later in January 2016, Baker County coordinated with the BLM to adjust the route-variation option and recommend another local route-variation option, Burnt River West route-variation option that would further reduce impacts on agricultural lands and sensitive resources. The route-variation options described here are addressed as a part of alternative routes in Segment 3 (Section 2.5.2.3).

Burnt River Canyon Route-Variation Option

Commenters recommended a localized route-variation option at the crossing of Burnt River Canyon in proximity to the mouth of the canyon. These are short route variations; it would be about 0.6 mile (at the widest point) farther west of the current Burnt River Alternative. The intent of this adjustment is to move the alternative route variations farther west from the mouth of Burnt River Canyon to reduce visual impacts and avoid crossing the irrigated agriculture area. The Burnt River Canyon route-variation option is addressed as a segment of alternative route in Segment 3 (Section 2.5.2.3).

Segment 4—Brogan

Brogan Route-Variation Option

A nongovernmental organization, Stop Idaho Power, recommended a route-variation option to the south of the Applicant's Proposed Action Alternative in southern Baker County and northern Malheur County, for approximately 8 miles before sharing an alignment with the Willow Creek Alternative, and circumvents Little Valley, Striped Mountain, Brosman Mountain, McDowell Butte. The intent of this route variation is to avoid two 2-mile buffers around sage-grouse leks near Brogan. However, while it avoids the two buffer areas, it is entirely in Greater Sage-Grouse PHMA. The route-variation option does not offer substantive improvement over the alternative route to the east, which minimizes the impacts on priority sage-grouse habitat in this area and uses portions of the West-wide Energy Corridor. This route-variation option was considered but eliminated from detailed analysis (Section 2.5.4.3).

Segment 5—Malheur

Owyhee River Crossing Route-Variation Options

Comments on the Draft EIS recommended a variation of the Applicant's Proposed Action Alternative route that would move the alignment crossing the Owyhee River to the east to reduce effects on visual resources and to be located in the BLM-designated utility corridor. However, the recommended route-variation option would still cross the river in a segment of the river determined by the BLM as suitable for designation as a Wild and Scenic River (WSR). The recommended route-variation option would include structures that would be skylined on a bluff along the south side of the river. Both the Applicant's Proposed Action Alternative route and the recommended route-variation option are within the portion of the river that the BLM has determined suitable for designation as a National WSR with an outstanding remarkable value classification of recreational. The river's wild and scenic characteristics would be degraded through the visual influence of these structures as recreation users enter the canyon further to the southwest.

In response to this issue, the BLM developed a route-variation option that is farther to the east and outside of the area designated as suitable, but located in the BLM-designated utility corridor. Since the BLM developed a viable route-variation option to address the issue, the recommended route-variation option was eliminated from detailed analysis in the Final EIS (Section 2.5.4). The route-variation option developed by the BLM is a slight variation of the Applicant's Proposed Action Alternative route at the crossing of the Owyhee River addressed in Section 2.5.2.5.

Segment 6—Treasure Valley

Jump Creek Route-Variation Option

A letter from a consortium of the Oregon Natural Desert Association, Idaho Conservation League, Oregon Wild, Hells Canyon Preservation Council, and the Wilderness Society recommended a route-variation option located farther north from the Jump Creek recreation area. Due to the visual sensitivity of this recreation area, the intent of the route-variation option is to increase the distance between Jump Creek and the B2H Project while being located adjacent to existing transmission lines. This route-variation option was considered but eliminated from detailed analysis, as explained in Section 2.5.4.3.

2.2 Proposed Action

As introduced in Section 1.1, the proposed B2H Project includes the following:

- Constructing, operating, and maintaining a single-circuit, 500-kV, alternating current (AC), overhead transmission line in a 250-foot-wide right-of-way (except where crossing the NWSTF

Boardman) from the planned Longhorn Substation near Boardman in Morrow County, Oregon, to the Hemingway Substation in Owyhee County, Idaho, a distance of approximately 300 miles (depending on the route selected)(ancillary facilities include temporary access roads and permanent service roads; and temporary multi-use yards, helicopter fly yards, and pulling-and-tensioning sites); and geotechnical investigations would be completed in advance of final design and engineering;

- Constructing a 500-kV connection in the planned Longhorn Substation;
- Constructing a communication system to control the transmission line and manage the flow of electricity, with regeneration sites approximately every 40 miles;
- Removing the exiting BPA 69-kV transmission line partially or entirely from the NWSTF Boardman (to allow construction of the proposed 500-kV line);
- Potentially relocating approximately 0.9 mile of existing 230-kV transmission line in the vicinity of Flagstaff to allow for efficient placement of the 500-kV line; and
- Potentially relocating an approximately 5.3-mile-long section of existing 138-kV line in the vicinity of Weatherby, Oregon, with an existing 69-kV line; the structures would be rebuilt to accommodate the two transmission lines (i.e., double-circuit 138/69-kV) (and a 12-kV line underbuild), enabling use of the 138-kV line right-of-way for the proposed 500-kV transmission line.

Also, although not part of the Applicant's Proposed Action, it is anticipated that the existing BPA 69-kV line, displaced by the proposed 500-kV transmission line, may be relocated to the east of Bombing Range Road. This additional action of replacing the BPA 69-kV transmission line is a connected action under the NEPA, the effects of which the BLM must analyze and address in the EIS. This action is described in Section 2.3.1 and the potential effects of this action are reported throughout Chapter 3.

2.3 Project Description – Common to All Action Alternatives

2.3.1 System Components

The transmission line system is made up of the right-of-way, transmission and foundation structures, conductors, grounding system, communication station sites, and associated hardware. This section provides descriptions of the various components of the transmission line system proposed for the B2H Project. Table 2-1 is a summary of the typical design characteristics of the 500-kV transmission line and the land that would be temporarily and/or permanently disturbed. Similar information is provided for the double-circuit 138/69-kV line and section of 230-kV line that may be relocated.

Table 2-1. Typical Design Characteristics	
Feature	**Description**
500-Kilovolt Transmission Line	
Line length	Proposed Action 271.7 miles of single circuit 500-kV
Types of structures, height, average span	Single-circuit lattice structure: • 75- to 195 feet tall • 1,200- to 1,800-foot spans (approximately 4 to 3 structures per mile) Single-circuit two-pole H-frame structure: • 85- to 100-feet tall • 450- to 600-foot spans (approximately 12 to 9 structures per mile) Alternative single-circuit two-pole H-frame structure • 85- to 165-feet tall • 600- to 1,300-foot spans (approximately 9 to 4 structures per mile) Alternative single-circuit three-pole H-frame structure – 85 to 165 feet • 85- to 165-feet tall • 600- to 1,300-foot spans (approximately 9 to 4 structures per mile)
Typical Right-of-way width	250 feet
Land Temporarily Disturbed	
Structure construction footprint	• Single-circuit lattice structure – 250 by 250 feet (1.4 acres) • Single-circuit two-pole H-frame structure – 250 by 90 feet (0.5 acre) • Alternative single-circuit two-pole H-frame structure – 250 by 90 feet (0.5 acre) • Alternative single-circuit three-pole H-frame structure – 250 by 90 feet (0.5 acre)
Pulling and Tensioning sites (includes some light duty fly yards)	10 acres (5 acres per each end of conductor) every 1.5 to 2 miles
Multi-use Areas (includes fly yards)	Approximately 30 acre sites located approximately every 15 miles
Access roads	Typically 14-foot-wide operational width with 16 to 35 feet wide construction disturbance (based on soils and terrain)
Land Permanently Required	
Structure operations footprint	• Single-circuit lattice structure – 50 by 50 feet (0.06 acre) • Single-circuit two-pole H-frame structure – 50 by 15 feet (0.02 acre) • Alternative single-circuit two-pole H-frame structure – 50 by 15 feet (0.02 acre) • Alternative single-circuit three-pole H-frame structure – 90 by 15 feet (0.03 acre)
Communication sites	100- by 100-foot area with 75- by 75-foot fenced area and a 12- by 32- by 9-foot building; located inside the right-of-way approximately every 40 miles
Access roads	New access roads typically would be revegetated (not recontoured) leaving the road for maintenance/operations
Electrical Properties	
Nominal voltage	500-kilovolt (kV) alternating current line-to-line
Circuit configuration	Single circuit, three phase triple-bundle configuration
Minimum ground clearance of conductor	29.5 feet minimal, increased to 35.5 feet in agricultural use areas
230-Kilovolt Double-Circuit Transmission Line	
Line length	12.2 to 15.6 miles
Types of structures, height, average span and number of structures	Double-circuit monopole • Not to exceed 100 feet • 400- to 600-foot spans Approximately 161 to 206 structures
Right-of-way width	55 feet

Table 2-1. Typical Design Characteristics	
Feature	**Description**
Land Temporarily Disturbed	
Structure construction footprint	100 by 150 feet per structure (0.3 acre)
Wire-pulling/splicing sites	1.2 acres along right-of-way every 1 to 2 miles
Land Permanently Required	
Structure operations footprint	25 by 15 feet per structure (0.1 acre)
Electrical Properties	
Nominal voltage	230-kV alternating current
Circuit configuration	Double circuit
Minimum ground clearance of conductor	27 feet minimum
230-Kilovolt Transmission Line	
Line lengths	0.9 mile of 230-kV single-circuit to rebuild
Types of structures, height, average span and number of structures	Single-circuit two-pole H-frame structure (approximately three) • 50-feet to 90-feet tall • 400- to 1,200-foot spans • Approximately three structures Single-circuit three-pole H-frame structures (approximately three) • 50 feet to 90 feet • 110 to 1,400 • Approximately three structures
Right-of-way width	125 feet
Land Temporarily Disturbed	
Structure construction footprint	Single-circuit two-pole H-frame structure 100 by 150 feet per structure (0.3 acre) Single-circuit three-pole H-frame structure 125 by 150 feet per structure (0.4 acre)
Land Permanently Required	
Structure operations footprint	Single-circuit two-pole H-frame structure 25 feet by 15 feet (0.01 acre) Single-circuit three-pole H-frame structure 50 feet by 15 feet (0.02 acre)
Electrical Properties	
Nominal voltage	230-kV alternating current
Circuit configuration	Single-circuit, three-phase, triple-bundle configuration
Minimum ground clearance of conductor	27 feet minimal
138/69-kilovolt Transmission Lines	
Line length	5.4 miles of rebuilt 69-kV to 138/69-kV double circuit
Types of structures, height, average span and number of structures	Double-circuit monopole with distribution underbuild • 55- to 100-feet tall • 110- to 1,400-foot spans • Approximately 67 structures
Right-of-way width	100 feet
Land Temporarily Disturbed	
Structure construction footprint	100 by 100 feet per structure (0.2 acre)
Wire-pulling/splicing sites	1.2 acres along right-of-way every 1 to 2 miles.
Land Permanently Required	
Structure operations footprint	10 by 10 feet per structure

Table 2-1. Typical Design Characteristics	
Feature	**Description**
Electrical Properties	
Nominal voltage	138/69-kV alternating current
Circuit configuration	Double-circuit with distribution underbuild
Minimum ground clearance of conductor	22 feet above grade for 12.5-kV underbuild on 138/69-kV double-circuit
Table Source: Idaho Power Company 2016	

2.3.1.1 Right-of-Way

A transmission line easement or right-of-way is a strip of land (corridor) acquired from property owners. The agreement with the property owner grants the Applicant the right to build, operate, and maintain the transmission line as well as manage the vegetation in the authorized area. The Applicant would acquire rights for the route selected for construction of the proposed transmission line and access roads through right-of-way grants and easements with federal, state, and local governments; other companies (e.g., utilities, railroad); and private landowners.

The Applicant would acquire rights-of-way for transmission lines through mutual agreement with property owners for the use of their property of Eminent Domain that would be used as a last resort. The following tools may be used to acquire rights-of-way:

- **Easements** give the utility company the right to use the land owned by the individual for a specific purpose. Most commonly, negotiations directly with private property owners determine easement rights and restrictions for using portions of the land that remain owned by the individual.
- **Permitting** occurs when the utility applies for a permit to place the facility across public lands.
- **Eminent domain** is an option of last resort when all other options have been unsuccessful. In this case, the utility company may exercise its right to use the easement or property through court actions. Independent appraisers, through the court, would determine a fair price to be paid for the land use.

Property owners are compensated for easements regardless of how they are acquired. The value of the easement is determined using several different sources, including the assessor's records, an appraiser's corridor study and local comparable sales.

Rights to land for substation and communication sites would be obtained through easements or in fee simple title where located on private land.

Landowners have the right to restrict access by the general public to the easements. However, the easement allows the Applicant's employees to access the line as needed to operate and maintain the transmission line. The Applicant, cooperating with the landowner, would establish easement restrictions to ensure that a safe distance from the transmission line is always observed.

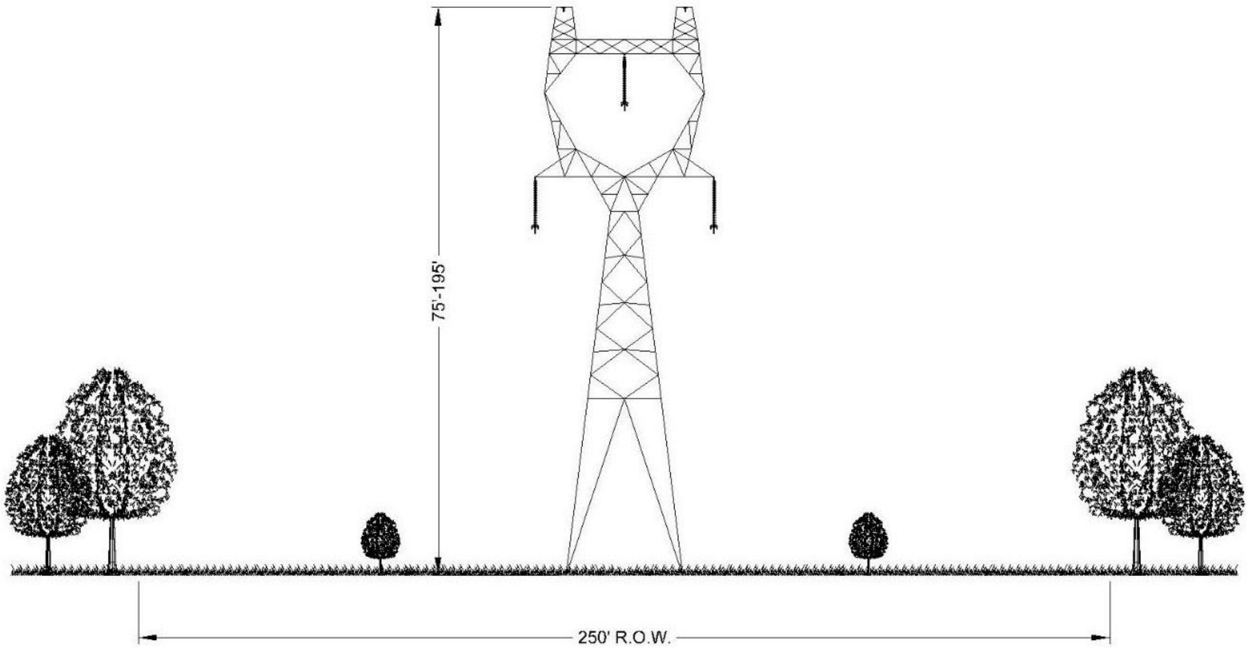
The Applicant would work with landowners to locate the facilities on the property, with consideration of engineering and environmental constraints, to ensure the continued use of their land. A 250-foot-wide easement is planned for the 500-kV steel lattice structure and the alternative steel pole H-frame structure.

A 90-foot-wide easement is anticipated for the proposed 500-kV transmission line where constructed along the west side of the eastern boundary of the NWSTF Boardman. The right-of-way for the 230-kV line relocation would be 125-feet wide and the right-of-way for the 138/69-kV double-circuit lines with the 12-kV distribution underbuild would be 100-feet wide. Rights-of-way designs are shown in Figures 2-1 through 2-4. Also, the right-of-way for the additional action of relocating the BPA's 69-kV line from the NWSTF Boardman is anticipated to be 55-feet wide.

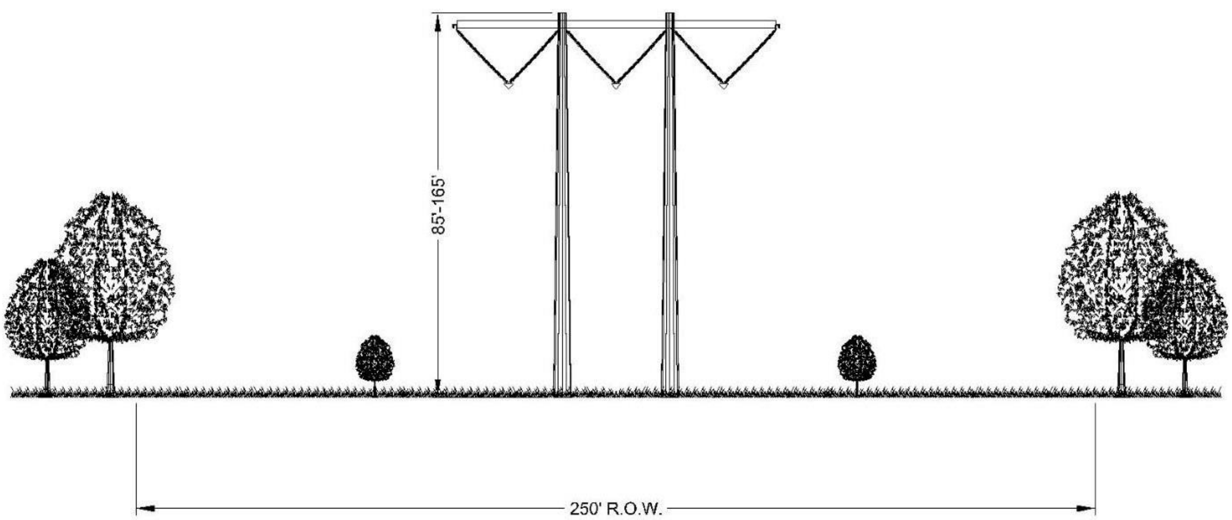
Right-of-way width requirements for the proposed transmission line are based on three criteria:

- Sufficient National Electrical Safety Code (NESC) clearance must be maintained to the edge of the right-of-way during a wind event when the conductors are blown towards the right-of-way edge.
- Sufficient room must be provided within the right-of-way to perform transmission line maintenance.
- Sufficient clearances must be maintained from the transmission line to the edge of the right-of-way where structures or trees may be located and deemed a hazard or danger to the transmission line. A narrower right-of-way could be accommodated in some areas, but in others, the full 250 feet (125 feet on each side of the centerline) would be required. A narrower right-of-way in forested areas can result in reliability problems. Falling trees are a major cause of outages and damage to transmission lines. In addition, many forest managers are resistant to allowing utilities to remove hazardous trees, which make reducing the right-of way in forested areas infeasible.

Specific localized conditions may result in slightly different right-of-way widths. These will be finalized during the detailed design. There is one potential exception known at this time; that is, if a route is selected along the west side of Bombing Range Road, the Applicant proposes that the easement for the proposed 500-kV transmission line would be 90 feet wide to repurpose the area currently used for the existing BPA 69-kV transmission line.



Proposed 500-kV Lattice Steel Right-of-Way Design



Proposed 500-kV Steel-Pole H-Frame Right-of-Way Design

Figure 2-1. 500-kV Right-of-Way Designs

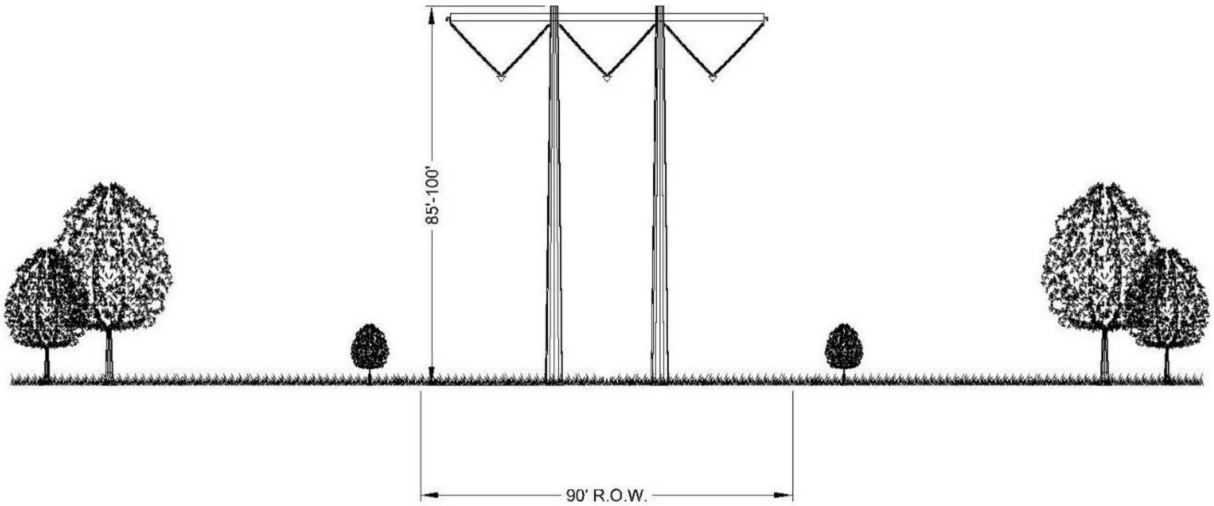


Figure 2-2. Alternate 500-kV Steel Pole Right-of-Way Design
(on and adjacent to the NWSTF Boardman only)

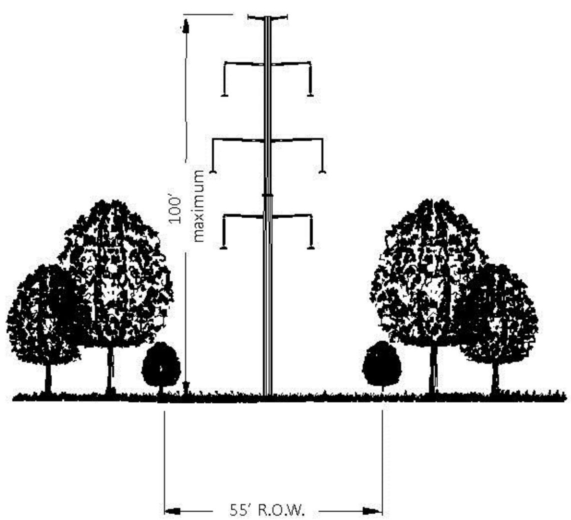


Figure 2-3. 230-kV Steel Monopole Double-Circuit Right-of-Way Design

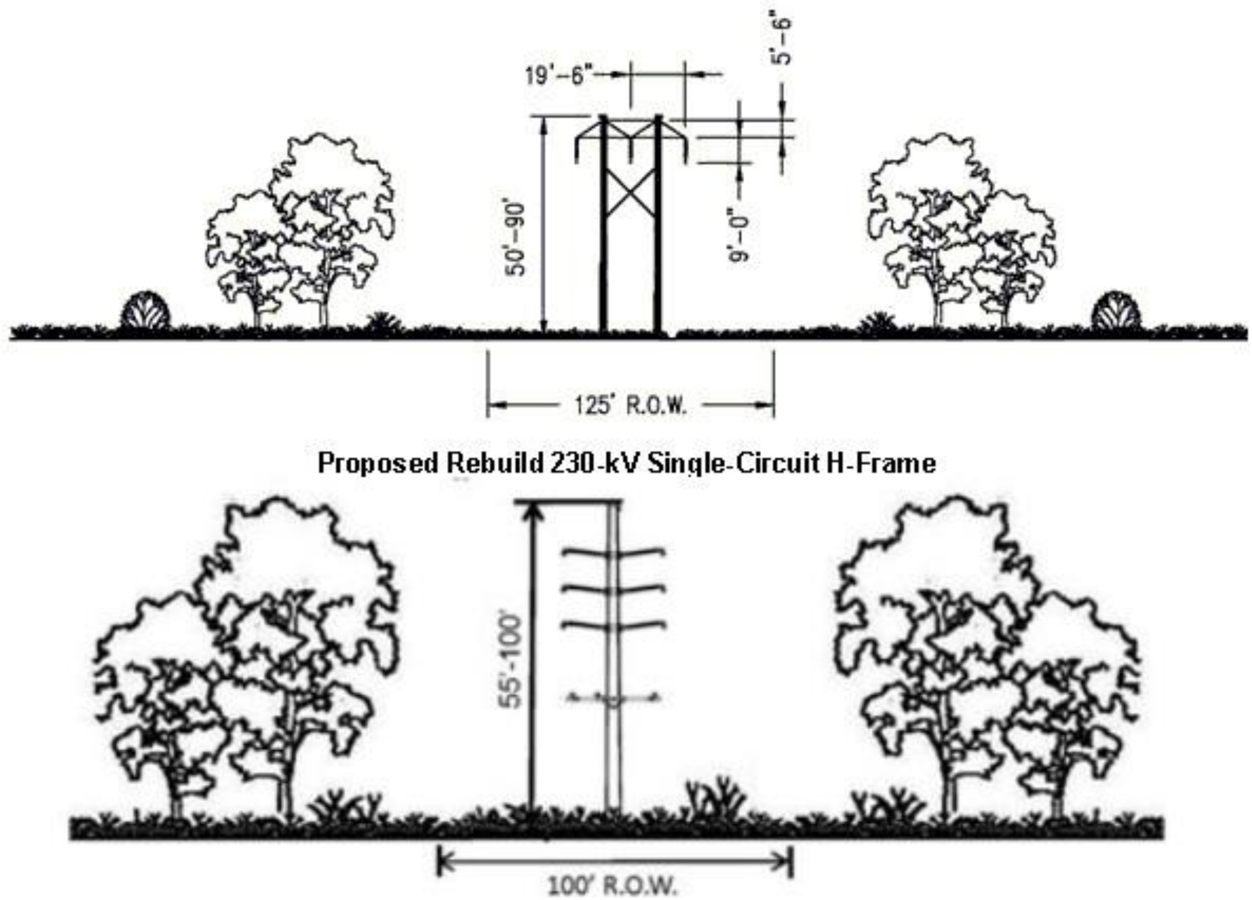


Figure 2-4. 230-kV and 138-kV/69-kV Right-of-Way Designs

Right-of-way would comply with NERC reliability standards and Western Electricity Coordinating Council reliability criteria. The Western Electricity Coordinating Council reliability criteria recognize the unique nature of the Western Electricity Coordinating Council system, where there are several instances of multiple long-distance transmission lines running parallel within a corridor and transferring power from remote generation location to distant load centers. At the time, the November 2011 Revised POD and right-of-way application were submitted, the Western Electricity Coordinating Council criteria required a minimum separation by at least, "the longest span or 500 feet, whichever is greater, between the transmission circuits (TPL-[001-004]-WECC-1-CR, April 18, 2008)[2] For the purposes of making its right-of-way application, the Applicant assumed the separation between the transmission lines would be approximately 1,500 feet. Land between rights-of-way that are separated to meet reliability criteria would not be encumbered with an easement but could be limited practically in land uses due to the proximity of two or more large transmission lines. In 2012, the Western Electricity Coordinating Council retired the definition of common corridor and introduced Adjacent Transmission Circuits defined as "two transmission circuits with separation between their centerlines less than 250 feet at the point of

[2]The B2H Project transmission line would be consistent with the 2012 WECC guidance, NERC and WECC reliability standards (TPL-004-0(i)(a), and 70 Federal Regulation 20970, 20970-71 (April 22, 2015).

separation" (Western Electricity Coordinating Council 2013). The Applicant clarified that it proposes to separate by 125 feet from any radial 230-kV line associated with existing or new wind-generation projects (Idaho Power Company 2016)

After the transmission line has been energized, agricultural and nonagricultural land uses that are compatible with safety regulation would be permitted in the right-of-way, subject to limitations. Limitations on the use of equipment taller than 15 feet under the transmission line or around structures except for noted below; restrictions on crops that can grow to more than 15 feet at maturity (such as timber) within 25 feet of the outermost phase conductor; restrictions on storage of flammable materials of any kind on the right-of-way; restrictions on refueling equipment under the transmission line; restrictions on grading, land recontouring, and material stockpiling under the transmission line or near structure locations; and required coordination with the Applicant for the construction of fences, irrigation lines, or other facilities that could be subject to induced current and for the use of agricultural equipment taller than 20 feet.

2.3.1.2 Transmission Line Structures

A number of different types of structures may be used for the transmission line. The majority of the transmission line circuits would be supported by 500-kV single-circuit steel lattice structures; however, the Applicant would use other types of structures for special purposes. A description of the various types of structures follows.

- **Tangent Structures:** Tangent structures are the most common type of structure and would be used along straight sections of the alignment. These structures are designed to support a range of wind and ice loading conditions but will only support loads associated with very slight line angles (0 to 1 degree). A typical tangent 500-kV single-circuit lattice structure is illustrated in Figure 2-5.
- **Angle Structures:** Angle structures are used at angle points along the transmission line. Angle structures that are not designed as dead-end or terminal structures are called "running" angle structures. "Running" angle structures are designed to support a range of wind and ice loading conditions and will support the loads associated with moderate angles up to 25 degrees. Angle structures typically are designed for a specific range of angles—3 to 10 degrees, 10 to 25 degrees, etc.
- **Dead-end Structures:** Dead-end structures generally are used at station termination points, line angles greater than 25 degrees, on each end of long spans such as those crossing canyons and wide rivers, and other points along the transmission line where it is appropriate to support the tension in the conductor. Dead-end structures are designed to support the vertical loads, transverse loads, line-angle loads (where appropriate), and the longitudinal load of the conductor. Dead-end structures also may be used in situations where maintaining clearance is difficult with tangent structures.
- **Steel Monopoles:** Single poles, or monopoles, are tubular steel structures fabricated from high-strength plate steel formed into tubes. Tubular poles can be fabricated into various structure

configurations including single-pole (Figures 2-8 and 2-10), two-pole H-frame (Figures 2-6, 2-7, and 2-9), and three-pole. Tubular steel may be galvanized or made from weathering steel. Tubular steel structures may be imbedded directly or bolted to drilled piers, piles, or a cast-in-place foundation, allowing their use in various soils. Tubular steel, single-pole, double-circuit structures are proposed for the relocation of the BPA's 69-kV transmission line from its current placement on the west side of eastern boundary of the NWSTF Boardman to the east side of Bombing Range Road. Tubular steel, single-pole structures also are proposed for the 138/69-kV double circuit segment of line that may be relocated in Baker County. Two-pole H frame structures are proposed for the segment of 230-kV line that may be relocated in Baker County. Two-pole H-frame 500-kV structures would be used in the vicinity of the NWSTF Boardman (at a reduced height not to exceed 100 feet). Also, 500-kV two-pole H-frame structures may be used as an alternative to the 500-kV lattice, if needed.

- **Transmission Line Crossing Structures:** Transmission line crossing structures are fabricated from high-strength steel. These structures may be delta-configuration lattice steel structures or tubular steel H-frame structures. Preferably, these structures are located perpendicular to the line being crossed. These structures' arrangements would allow the 500-kV line to cross over the top of lower voltage transmission lines or under other 500-kV lines when necessary. Crossing structures would have the same design properties as other transmission-line structures.
- **Transpositional Structures:** At certain points along the transmission line, it may be necessary to install transpositional structures, which is a transmission-line structure used to "transpose" each of the three phases (or conductors) in the transmission circuit so that each phase changes its relative place in the transmission circuit. Transpositional structures used on the B2H Project would be modified dead-end structures with added arms and insulator strings that would allow the phases to move to different positions on the structure. The need to install a transpositional structure is dependent on the electrical characteristics and length of the line and the need to balance the electrical impedance of the transmission line between stations.

In addition, a typical 230-kV single-circuit H-frame structure is illustrated on Figure 2-9 and a typical 138/69-kV structure with a 12-kV distribution underbuild is illustrated in Figure 2-10.

Table 2-1 provides a summary of the typical characteristics of the proposed and alternative transmission line structure characteristics.

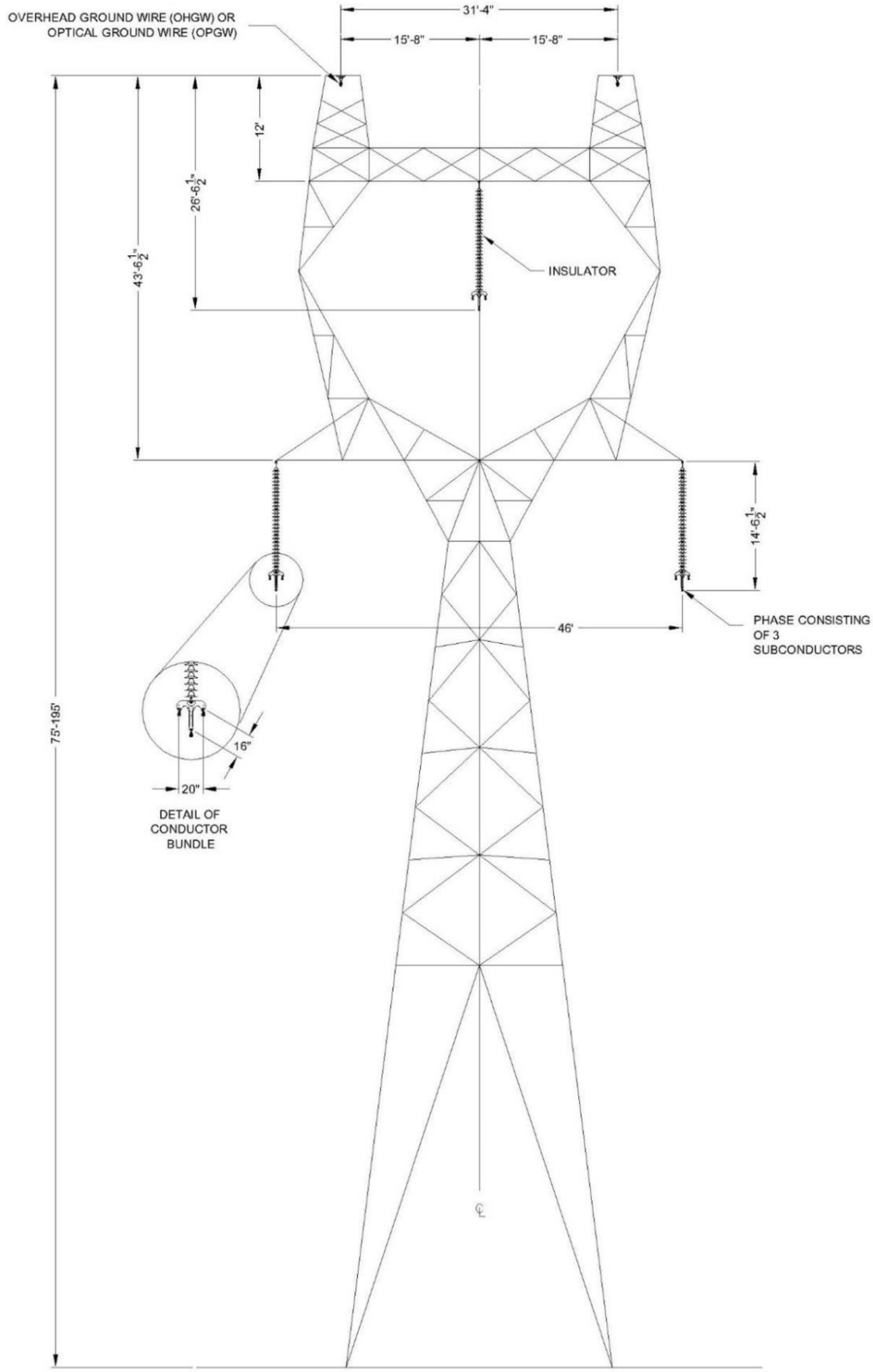


Figure 2-5. Proposed 500-kV Single-Circuit Lattice Steel Structure

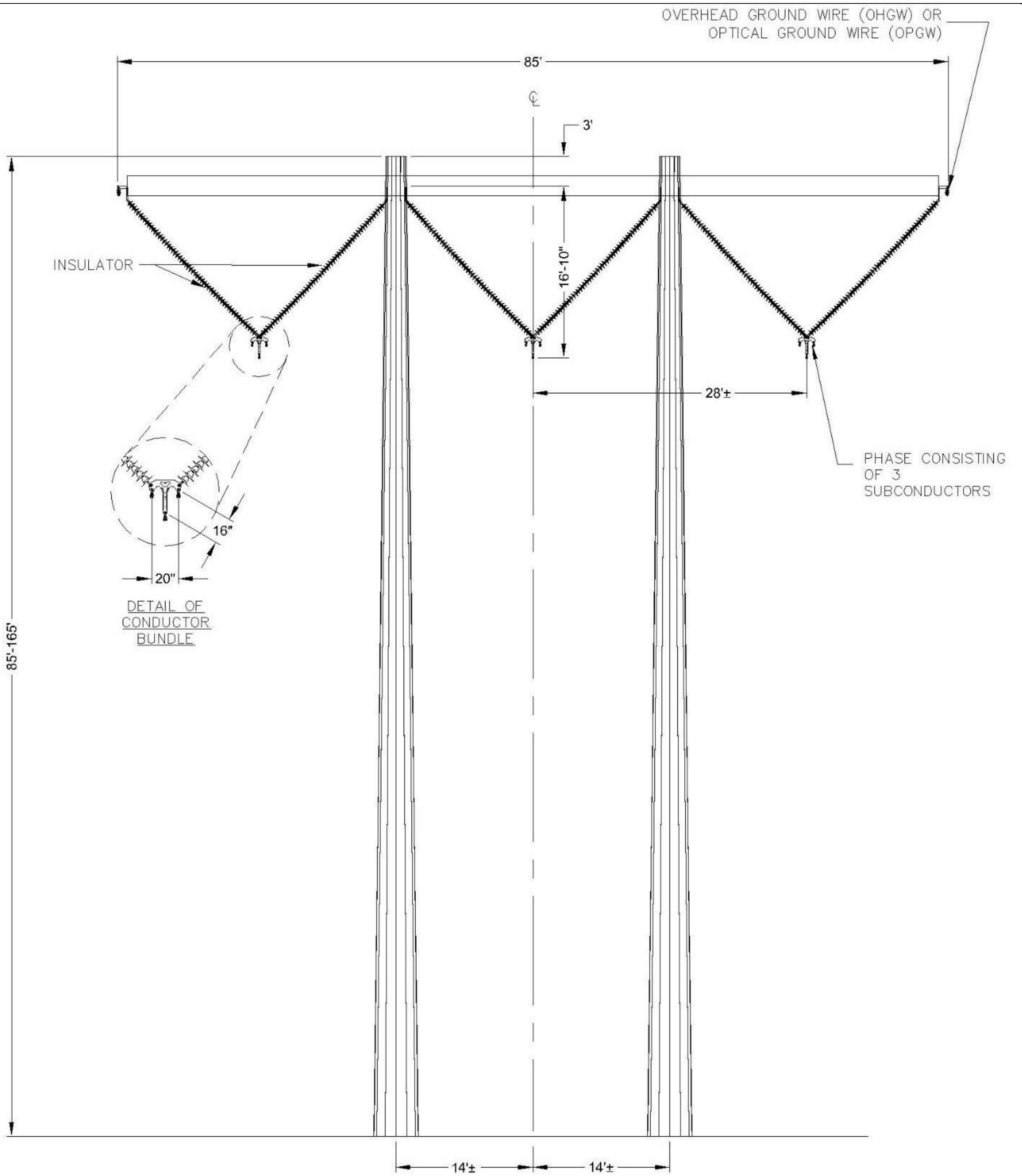


Figure 2-6. Proposed 500-kV Single-Circuit Tubular Steel Two-Pole H-Frame Structure

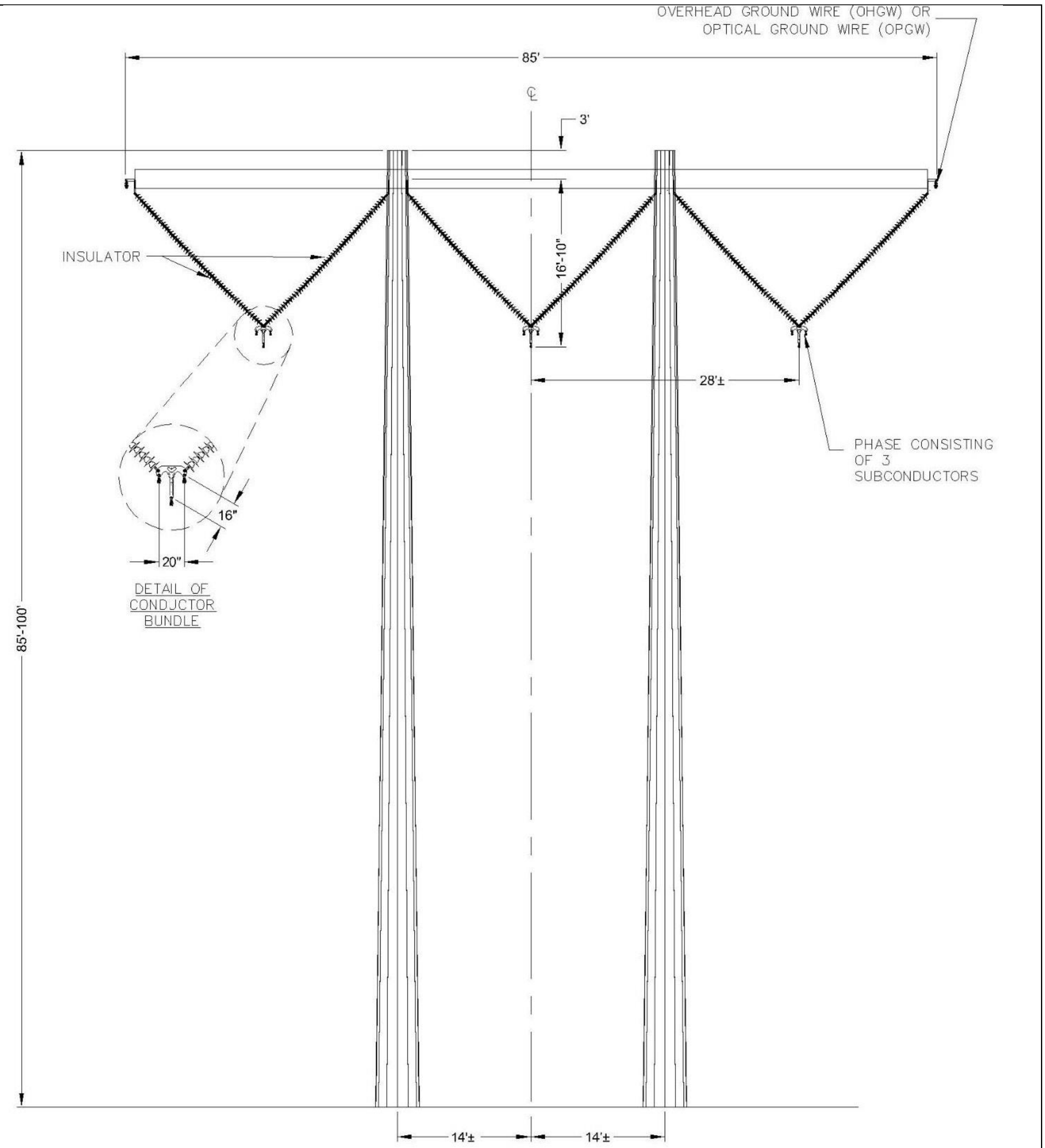


Figure 2-7. Alternative 500-kV Single-Circuit Tubular Steel Two-Pole H-Frame Structure
(on or adjacent to the NWSTF Boardman only)

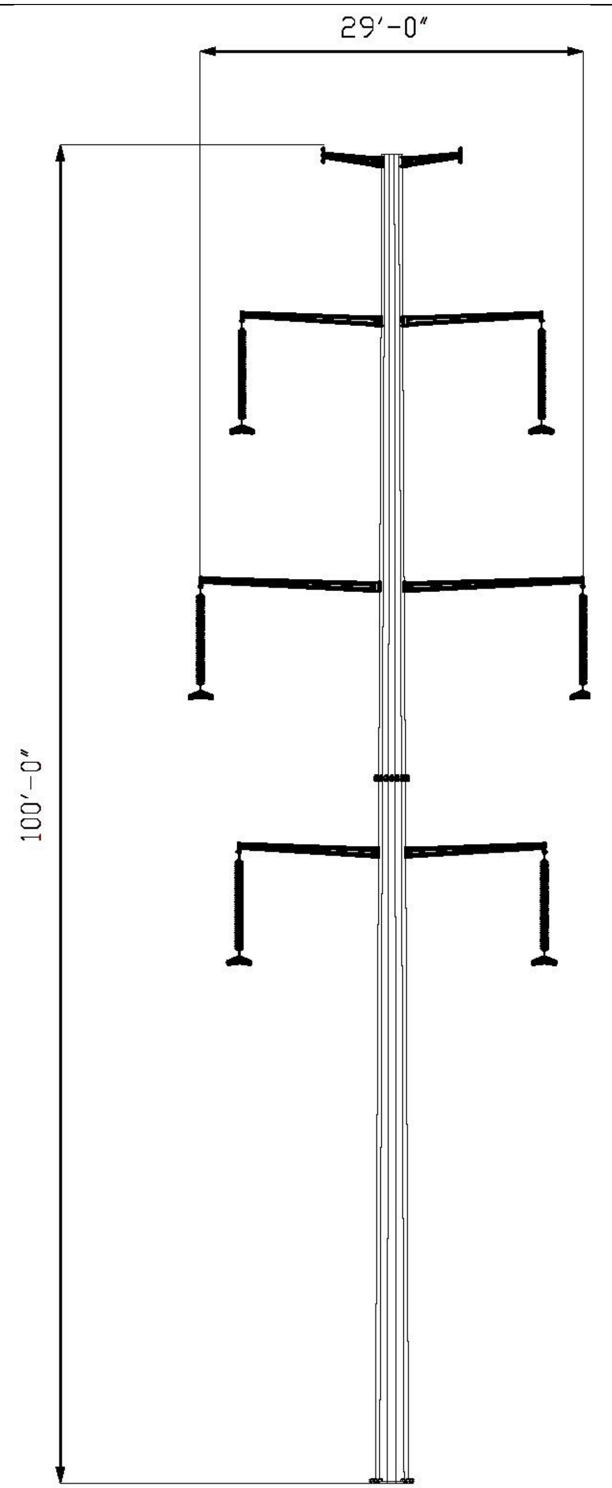


Figure 2-8. Proposed 230-kV Steel Monopole Double-Circuit Structure

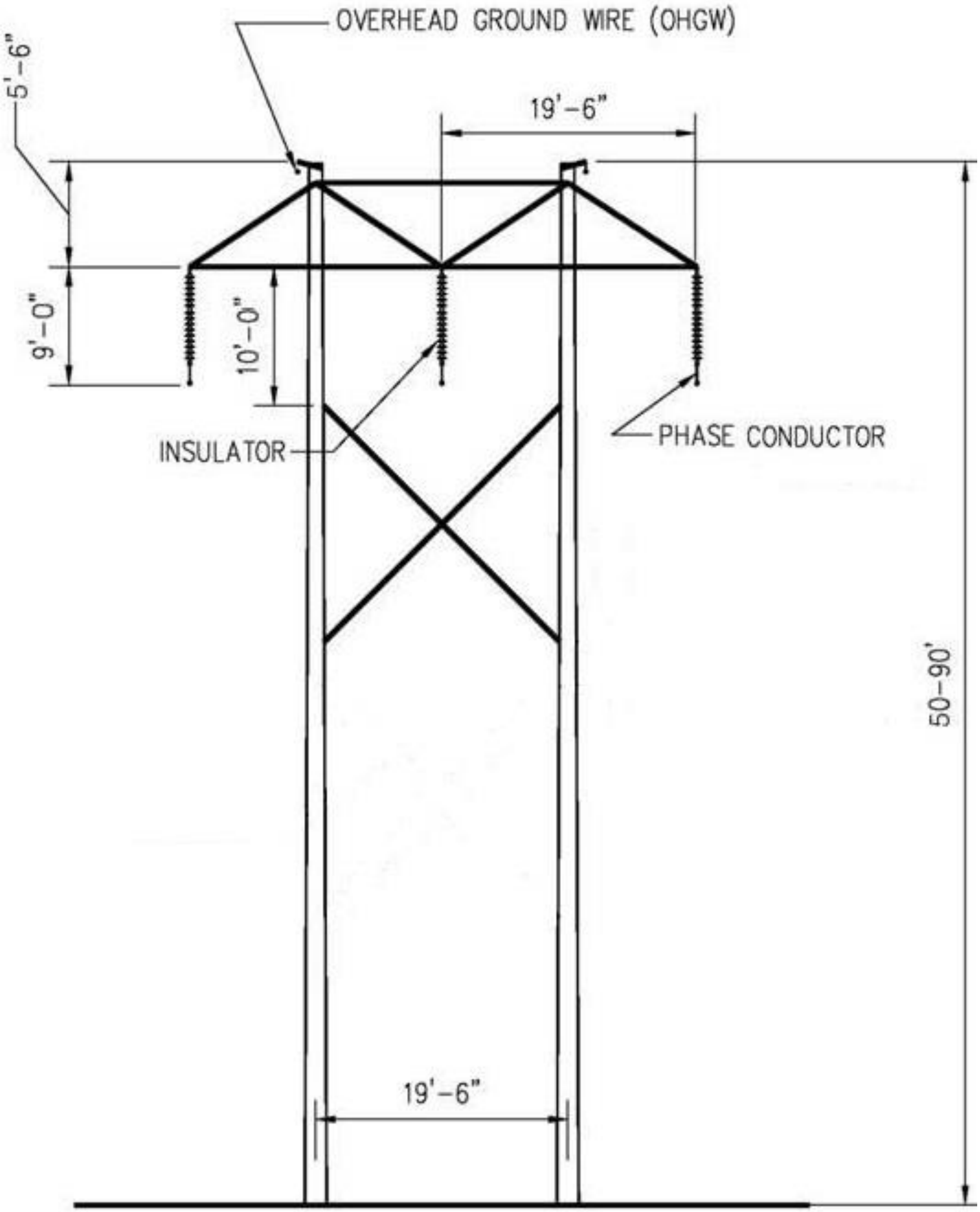


Figure 2-9. Proposed Rebuild Single-Circuit 230-kV H-Frame Structure

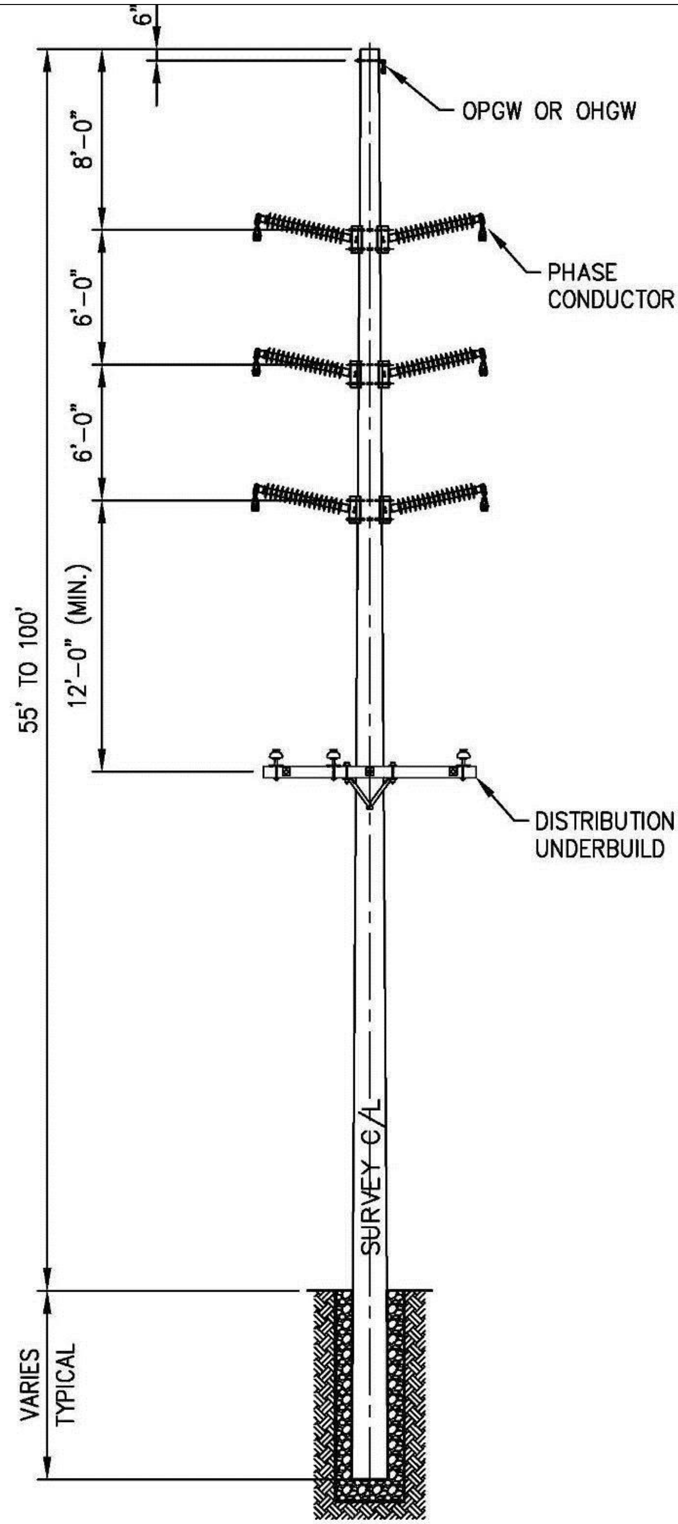


Figure 2-10. Proposed 138/69-kV Double-Circuit Steel Monopole Structure with 12.5-kV Distribution Underbuild

STRUCTURE AND CONDUCTOR CLEARANCES

Conductor phase-to-phase and phase-to-ground clearance parameters are determined in accordance with the Applicant's company standards and the NESC, ANSI C2, produced by the American National Standards Institute (ANSI). These documents provide minimum distances between the conductors and ground, crossing points of other lines and the transmission support structure, and other conductors, and minimum work clearances for personnel during energized operation and maintenance activities (Institute of Electrical and Electronics Engineers 2011). Typically, the clearance of conductors above ground is 29.5 feet for 500-kV lines, but where the line crosses land used for agricultural purposes, a minimum clearance of 35.5 feet would be used to allow for equipment clearance.

For the 230-kV line relocation section, the minimal clearance of conductors above ground is 27 feet. For the 138/69-kV double-circuit section, the 12.5-kV distribution conductor minimal clearance is 22 feet above grade.

STRUCTURE FOUNDATIONS

The 500-kV single-circuit steel lattice structures each require four foundations, one on each corner of the lattice towers. The foundation style, diameter, and depth would be determined during final design and are dependent on structure loading conditions and the type of soil or rock present at each specific site. The preliminary design indicates the foundations for the single-circuit tangent lattice structures would be composed of steel-reinforced concrete drilled piers with a typical diameter of 4 feet and a depth of approximately 15 feet. For the 500-kV H-frame structures, each tangent structure would require two foundations, one for each pole that comprises the H-frame structure. Angle and dead-end structures would use a three-pole structure, each pole having its own foundation. The foundations would be steel-reinforced drilled piers with a typical diameter of 6 to 8 feet and a depth of approximately 25 to 40 feet.

For the 230-kV H-frame structures, each of the two poles for tangent structures would be direct-embedded. Typical direct-embedded foundation sizes would be approximately 5 feet in diameter and approximately 5 feet deep. The 138-kV monopole structures would be a combination of direct-embedded steel poles and self-supported poles on drilled pier foundations. Tangent structures would be direct-embedded steel poles in a single drilled boring, typically 5 feet in diameter and 15 feet deep. Angle and dead-end structures would be on steel-reinforced drilled pier foundations with a typical diameter of 5 to 6 feet and a depth of approximately 20 to 25 feet.

Typical foundation diameters and depths for the proposed structure families are shown in Table 2-2.

Table 2-2. Foundation Excavation Dimensions

Proposed or Alternative Structure	Holes per Structure	Typical Depth (feet)	Typical Diameter (feet)	Estimated Concrete Volume (cubic yards)
500-kV single-circuit – light tangent lattice structure	4	15	4	28
500-kV single-circuit – heavy tangent lattice structure	4	18	5	52
500-kV single-circuit – small angle lattice structure	4	16	6	68
500-kV single-circuit – medium angle lattice structure	4	21	6.5	104
500-kV single-circuit – medium dead-end lattice structure	4	28	7	160
500-kV single-circuit – heavy dead-end lattice structure	4	30	7	172
500-kV single-circuit two-pole tangent H-frame structure	2	25	6	53
500-kV single-circuit three-pole angle H-frame structure	3	30	7	129
500-kV single-circuit three-pole dead-end H-frame structure	3	40	8	224
230-kV double-circuit monopole structure	1	18	4	226
230-kV single-circuit two-pole tangent H-frame structure	2	12	5	NA
230-kV single-circuit three-pole angle H-frame structure	3	12	5	NA
230-kV single-circuit three-pole dead-end guyed structure	3	12	5	NA
138/69-kV double-circuit monopole tangent structure (direct-embedded)	1	15	5	NA
138/69-kV double-circuit monopole angle structure	1	20	5	15
138/69-kV double-circuit monopole dead-end structure	1	25	6	27

CONDUCTORS

The proposed conductor for the 500-kV lattice structure is 3-1519 KCM[3] aluminum conductor steel reinforced with trapezoidal aluminum wires (ACSR/TW) “Deschutes.” Each phase of the 500-kV three-phase circuit would be composed of three subconductors in a triple-bundle configuration. The individual 159 KCM conductors would be bundled in a triangular configuration with spacing of 20 inches between horizontal subconductors and 16 inches of diagonal separation between the top two conductors and the lower conductor. The triple-bundled configuration is proposed to provide adequate current carrying

[3]A thousand circular mils

capacity and to provide for a reduction in audible noise and radio interference as compared to a single large-diameter conductor. Each 500-kV subconductor would have a 45/7 aluminum/steel stranding, with an overall conductor diameter of 1.300 inches and a weight of 1.432 pounds per foot and a non-specular finish[4].

Where multiple conductors are used in a bundle for each phase, the bundle spacing would be maintained through the use of conductor spacers at intermediate points along the conductor bundle between each structure. The spacers serve a dual purpose: in addition to maintaining the correct bundle configuration and spacing, the spacers also are designed to damp out wind-induced vibration in the conductors. The number of spacers required in each span between structures would be determined during final design of the transmission line.

The proposed conductor for the relocated 230-kV transmission line is 795 KCM 26/7 ACSR "Drake." Each phase of the 230-kV three-phase circuit would be composed of one conductor. Each conductor would have an overall diameter of 1.107 inches and a weight of 1.093 pounds per foot and a non-specular finish.

The proposed conductors for the 138/69-kV monopole structure lines are 397 KCM 26/7 ACSR "Ibis" (138-kV, one conductor per phase), 4/0 6/1 ACSR "Penguin" (69-kV, one conductor per phase), 2/0 ACSR "Quail" conductor (12.5-kV distribution, one conductor per phase plus neutral wire), and a 3/8 inch extra-high-strength (EHS) seven-strand shield wire at the top of the structures. Conductors would be aligned with typical vertical spacing of 8 feet between shield wire and 9- or 138-kV phase wires, 6 feet between phase wires, and a minimum of 12 feet between 138- or 69-kV phase wires and distribution wires.

OTHER HARDWARE

INSULATORS

Insulators are used to suspend each conductor bundle (phase) from the structure, maintaining the appropriate electrical clearance between conductors, the ground, and the structure. Dead-end insulator assemblies for the transmission lines would use an I-shaped configuration, which consists of insulators hung from either a structure dead-end arm or a dead-end pole in the form of an "I." Insulators would be composed of grey porcelain or green-tinted toughened glass. The typical insulator assemblies for 500-kV steel lattice tangent structures would consist of an insulator string hung in the form of an "I" (Figure 2-5). Insulator assemblies for the 500-kV H-frame structure would consist of two insulators strings hung in the form of a "V" (Figures 2-6 and 2-7).

GROUNDING SYSTEMS

AC transmission lines such as the B2H Project transmission line have the potential to induce currents on adjacent metal structures such as transmission lines, railroads, pipelines, fences, or structures that are parallel to, cross, or are adjacent to the transmission line. Induced current on these facilities occur

[4]Non-specular refers to a "dull" finish rather than a "shiny" finish.

to some degree during steady-state operating conditions and during a fault condition on the transmission line. For example, during a lightning strike on the line, the insulators may flash over causing a fault condition on the line and current will flow down the structure through the grounding system (i.e., ground rod or counterpoise) and into the ground. The magnitude of the current flows in the transmission line, the proximity of the adjacent facility to the line, and the distance (length) for which the two facilities parallel one another in proximity will vary.

The methods and equipment needed to mitigate these conditions would be determined through electrical studies of the specific situation. As standard practice and as part of the design of the B2H Project, electrical equipment and fencing at the station would be grounded. All fences, metal gates, pipelines, metal buildings, and other metal structures adjacent to the right-of-way that cross or are within the transmission line right-of-way would be grounded as determined necessary. If applicable, grounding of metallic objects outside the right-of-way also may occur, depending on the distance from the transmission line as determined through the electrical studies. These actions address induced currents to ground through ground rods, ground mats, and other grounding systems, thus reducing the effect that a person may experience when touching a metallic object near the line (i.e., reduce electric shock potential). Transmission line public health effects are discussed in Section 3.2.18.

Additional Minor Hardware

In addition to the conductors, insulators, and overhead shield wires, other hardware would be installed on the structure as part of the insulator assembly to support the conductors and shield wires. This hardware would include clamps, shackles, links, plates, and various other pieces composed of galvanized steel and aluminum.

A grounding system would be installed at the base of each transmission line structure that would consist of copper or copper-clad ground rods embedded into the ground in immediate proximity to the structure foundation and connected to the structure by a buried copper lead. When the resistance to ground for a grounded transmission line structure is greater than a specified impedance value with the use of ground rods, counterpoise would be installed to lower the resistance to below a specified impedance value. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep, extending from structures (from one or more legs of structure) for approximately 200 feet under the right-of-way.

Other hardware that is not associated with the transmission of electricity may be installed as part of the B2H Project. This hardware may include aerial marker spheres or aircraft warning lighting as required for the conductors or structures per Federal Aviation Administration (FAA) regulations[5]. Structures in proximity to airports and structure height are the determinants of whether FAA regulations would apply based on an assessment of wire/structure strike risk. The Applicant does not anticipate that structure

[5]U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular AC 70/7460-1K Obstruction Marking and Lighting, August 1, 2000; and Advisory Circular AC 70/7460-2K Proposed Construction of Alteration of objects that May Affect the Navigable Airspace, March 1, 2000.

lighting would be required because proposed structures would be less than 200 feet tall and would not be near airports that require structure lighting.

2.3.1.3 Substations

As stated previously, the northern terminus of the proposed transmission line would be the planned Longhorn Substation near Boardman, Oregon, and the southern terminus is the existing Hemingway Substation near Boise, Idaho.

The Applicant identified the need for an endpoint for the B2H Project in the area of the Boardman, Oregon, because it is the easternmost point at which the Applicant can feasibly interconnect to the Pacific Northwest power market. The proposed Longhorn Substation is on land BPA purchased from the Port of Morrow. For termination at the Longhorn Substation, the Applicant would install 500-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures, a 500-kV series capacitor bank, and 500-kV shunt reactor banks. The 500-kV transmission line termination structures would be approximately 125 to 135 feet tall. A control house to accommodate the system-communications and control equipment would be constructed as needed. A new all-weather access road would be used to reach the site, and distribution power for the site would be supplied from the nearby existing system, as needed. Fiber-optic signal communication equipment would be installed.

The existing Hemingway Substation, located approximately 30 miles southwest of Boise, Idaho, just off Highway 78, currently serves as a hub for the Applicant's Treasure Valley load. The Hemingway Substation has been designed to accommodate the B2H Project as well as other future projects. No additional ground disturbance outside the current substation would be required, and no new access road would be needed for access to the Hemingway Substation. The B2H Project 500-kV bay would contain high-voltage circuit breakers and switches, bus supports, series capacitor bank, shunt reactor banks, and control equipment similar to that described for the Longhorn Substation.

A typical 500-kV substation is illustrated in Figure 2-11. Figure 2-12 is a photograph of a typical 500-kV station with multiple line connections.

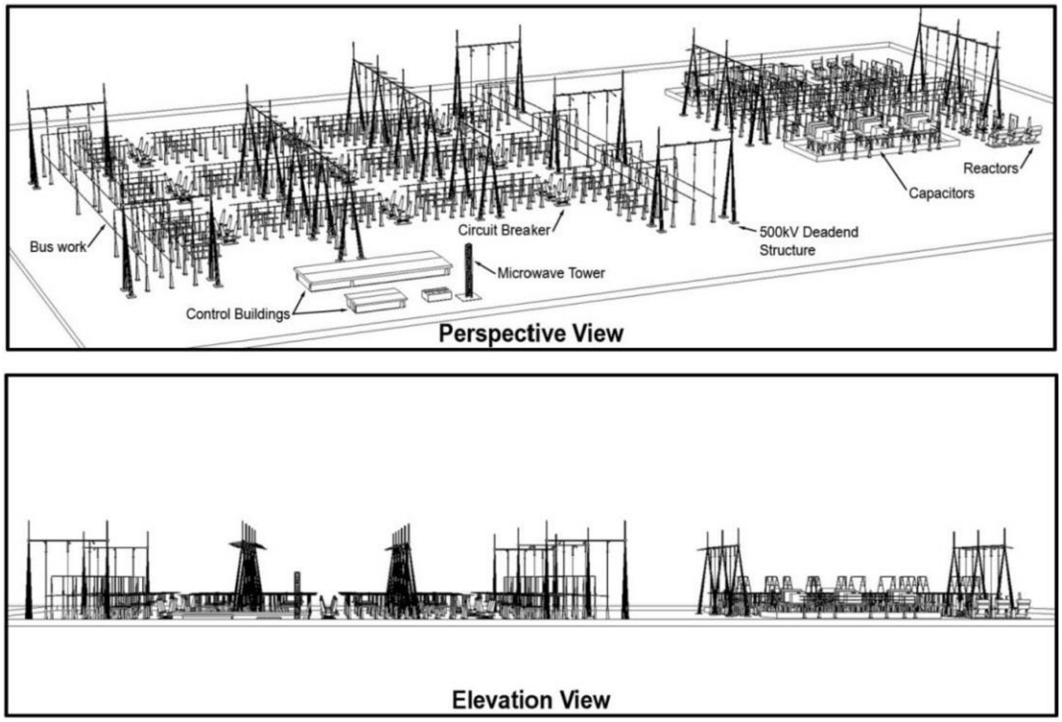


Figure 2-11. Typical 500-kV Substation

Figure 2-12. Typical 500-kV Substation

2.3.1.4 Communication System

To control the transmission line and manage the flow of electricity, a sophisticated internal communications system would be required. A major factor of the communications system is a fiber-optic line contained within one of the overhead grounding wires carried along the length of the transmission line. As the data signal is passed through the optical fiber cable, the signal degrades with distance. Consequently, signal communication sites (regeneration sites) are required to amplify the signals if the distance between substations or communications sites exceeds approximately 40 miles. As summarized in Table 2-1 a total of nine internal communications sites would be required for the Applicant's Proposed Action. Communication site spacing is approximately 40 miles, depending on access and proximity to local electric distribution lines. The typical site will be 100 feet by 100 feet, with a fenced area of 75 feet by 75 feet. A prefabricated concrete communications shelter with dimensions of approximately 12 feet by 32 feet by 9 feet tall will be placed on the site. Communications sites would be located on private and public lands.

Communications sites would consist of a communications shelter (building) and a standby generator with a liquid petroleum gas fuel tank, a fenced yard, an access road, and distribution power supply from the local distribution system. Two diverse cable routes (aerial and/or buried) from the transmission right-of-way to the equipment shelter would be required. Figure 2-13 illustrates the plan arrangement of a typical communications site.

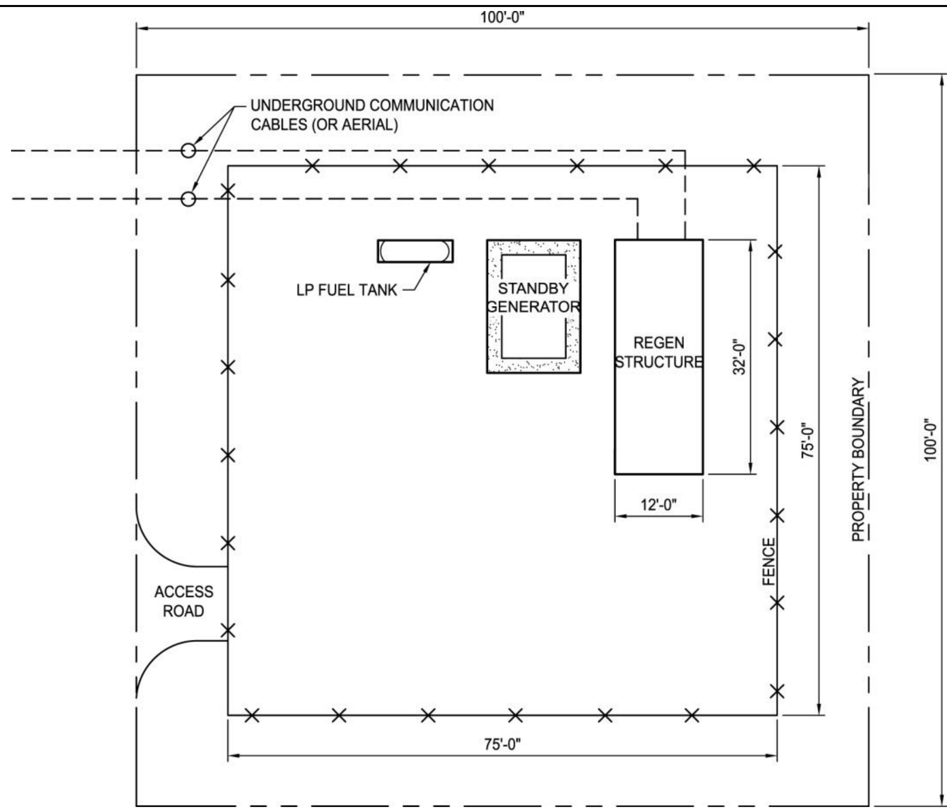


Figure 2-13. Typical Layout of Communication Station Site

OPTICAL GROUND WIRE

Reliable and secure communications for system control and monitoring is very important to maintain the operational integrity of the B2H Project and of the overall interconnected system. Primarily, communications for relaying and control would be provided via the optical ground wire (OPGW) that would be installed on the transmission-line structures; this path is intended for internal use by the Applicant. A second communication path (internal to the Applicant's system) would be provided over the Applicant's existing communication backbone system. No new microwave sites are planned for the B2H Project. Each 500-kV structure would have two lightning shield wires installed on the structure peaks. One of the shield wires would be composed of EHS steel wire with a diameter of 0.495 inch and a weight of 0.517 pound per foot. The second shield wire would be an OPGW constructed of aluminum, and would carry 48 glass fibers within its core. The OPGW would have a diameter of 0.646 inch and a weight of 0.407 pound per foot. The glass fibers inside the OPGW shield wire would provide optical data transfer capability among the Applicant's facilities along the fiber path. The data transferred are required for system control and monitoring.

POTENTIAL FOR CATHODIC PROTECTION

Siting a high-voltage transmission line in proximity and parallel to a metallic underground pipeline may require installation or upgrade of protective equipment to mitigate potential corrosion of the pipeline from induced voltage caused by the transmission line. Installation of the protective equipment, if not already existing, would require additional infrastructure and ground disturbance associated with the B2H Project[6]. As a general siting principle, the Applicant carefully scrutinized siting the proposed transmission line parallel to existing buried pipelines. The cost savings and potential for reduced construction impact of siting adjacent to existing pipelines is weighed against the impact on the underground pipelines and potential mitigation to address the impacts. This has been done to minimize disruption or required modification to existing protective systems and their supporting infrastructures. As the Applicant continues to consider new constraint information, the Applicant would continue to work to avoid interference with underground pipelines as well as other types of existing infrastructure to the maximum extent possible. Where it is not possible to move the proposed transmission line alignment away from a pipeline, the Applicant would work with the owner/operator of the pipeline to evaluate the interference from the B2H Project and see that the necessary protection system is put In place to protect the pipeline. In the B2H Project area, there are few opportunities for the proposed transmission line to parallel large-diameter pipelines.

2.3.1.5 RELATED AND SUPPORTING FACILITIES

Permanent and temporary related and supporting facilities include access roads, multi-use areas, pulling-and-tensioning sites, fly yards within some pulling-and-tensioning sites, and distribution lines to the communication stations.

[6] Where buried pipelines run parallel to a transmission line, they typically are protected by an impressed current cathodic protection (ICCP) system, which requires buried anodes connected to a direct-current power source, if not already installed by the pipeline owner/operator, will generally require construction of a new distribution line to serve the ICCP.

ACCESS ROADS

Access and service roads required for the B2H Project are described as three major types: (1) new roads (including new primitive roads or new bladed roads); (2) existing roads that will require substantial modification; and (3) existing roads that would not require substantial modification. To the extent possible, existing roads would be used in their present condition without improvements. Where applicable, the Applicant would conform to land-management–agency manuals for construction and maintenance.

Following is a description of the three access road types.

New roads proposed to be constructed in connection with the B2H Project include:

- New primitive roads would meet the following criteria:
  - Created by direct vehicle travel over native material and existing vegetation
  - Disturbance may include clearing of large woody vegetation and other obstructions to ensure safe vehicle operation
  - Generally would be present on the landscape as two-track roads leaving no disturbance beyond the edge of the travel surface
  - May require intermittent maintenance work to support continued safe vehicle passage during construction
  - Typical construction disturbance is 16 feet wide; the operational travelway width is 14 feet, which, after use for maintenance over the years, would become a 10-foot-wide two-track roadway
- New bladed roads would meet the following criteria:
  - Construction of new road prism across side slope greater than 8 percent or over rough and uneven terrain
  - Typical construction disturbance is 16 feet wide, but can be up to 35 feet wide as dictated by terrain and soil conditions; the operational width is 14 feet wide, which, after being reseeded and used over the years, would become a 10-foot-wide two-track roadway

Existing roads that would require substantial modification for construction and operation of the B2H Project satisfy the following criteria:

- Field reconnaissance and aerial photographs indicate that current road conditions are not adequate for construction of the B2H Project
- Proposed repair and/or construction activities would (1) increase the width of the existing road prism; (2) change the existing road alignment; (3) use materials inconsistent with the existing road surface; and/or (4) change the existing road profile
- Repairs using existing road surface materials within the existing road prism that would not change the road profiles are considered substantial modifications if they comprise greater than 20 percent of the road surface area defined by road prism width and longitudinal distance over a defined road segment
- Typical construction disturbance is 16 to 35 feet wide; the operational width is 14 feet wide.

After construction is complete, any new roads developed for the B2H Project connecting to multi-use areas would be removed and restored to preconstruction conditions, unless the landowner requests otherwise.

Existing roads that do not require substantial modification include existing paved or all-weather surfaced roads that meet the Applicant's road standards for a minimum operational width of 14 feet. These roads include existing maintained paved or all-weather surfaced roads that are able to be used in their current condition. It is anticipated that the use of these roads would not cause additional new disturbance outside of an established disturbed area. However, these roads could include regular maintenance to make the road passable for construction. Regular maintenance could include, but would not be limited to, minor blading activities, repair of washed out areas, wash-boarded areas, depressions requiring graveling, approach installation, and other minor improvements.

Waterbody Crossings with Access Roads

Access roads would be designed and constructed to minimize disruption of natural drainage patterns including perennial, intermittent, and ephemeral streams. As the engineering plans are advanced for new access roads, site-specific crossings would be designed. The Applicant would consult with the land-managing agency or landowner (if applicable) regarding relevant standards and guidelines pertaining to road-crossing methods at waterbodies and would be designed to meet a minimum of a 100-year flood event. The Applicant has committed that no vehicles and/or equipment would cross through streams supporting fish species listed as threatened, or endangered under the Endangered Species Act of 1973 (ESA) . Consultation would include site assessment, design, installation, and maintenance. New crossings of canals, ditches, and perennial streams would be avoided to the extent practicable by using existing crossings, but some new crossings are anticipated. The performance of stream crossings would be monitored for the life of the access road and would be maintained or repaired as necessary to protect water quality.

Four types of waterbody crossings potentially could be used as part of the B2H Project:

Type 1 – Drive-through with or without minor grading and/or minimal fill to match existing stream profile

Crossing of a seasonally dry channel.

Type 2 – Hardened drive-through ford

Crossing of a channel that includes grading and stabilization. Stream banks and approaches would be graded to improve vehicle passage and would be stabilized with rock, geotextile fabric, or other erosion-control devices. The streambed would in some areas be reinforced with coarse rock material, where approved by the land-management agency, to support vehicle loads, prevent erosion, and minimize sedimentation into the waterway. Rock would be installed in the streambed such that it would not raise the level of the streambed, thus allowing continued movement of water, fish, and debris. Fords may be constructed in small, shallow streams (less than 2-foot stream depth and 20-foot active stream width) and rocky substrates. Fords also may be appropriate on wider streams that have a poorly defined channel that often changes course from excessive bedload. A ford crossing results in an average disturbance profile of 25 feet wide (along the waterbody) and 50 feet long (along the roadway) for 1,000 square feet, or 0.02 acre at each crossing. Disturbance amount is estimated based on the need to move equipment into the riparian area to build the 14-foot-wide operational surface, as well as to protect the area from erosion by adding armoring.

Type 3 – Culvert

Crossing of a stream or seasonal drainage that includes installation of a culvert and a stable road surface established over the culvert for vehicle passage. Culverts would be designed and installed under the guidance of a qualified engineer who, in collaboration with a hydrologist and aquatic biologist, where required by the land-management agency, would recommend placement locations; culvert gradient, height, and sizing; and proper construction methods. Culvert design would consider bedload and debris size and volume. The disturbance footprint for culvert installation is estimated to be 50 feet wide (along the waterbody) and 150 feet long (along the road) for 7,500 square feet, or 0.17 acre at each crossing. Ground-disturbing activities would comply with agency-approved best management practices. Construction would occur during periods of low flow. The use of equipment in streams would be minimized. All culverts would be designed and installed to meet desired riparian conditions and fish passage requirements, as identified in applicable land-use-management plans. Culvert slope would not exceed stream gradient. Typically, culverts would be buried partially in the streambed to maintain streambed material in the culvert. Sandbags or other nonerosive material would be placed around the culverts to prevent scour or water flow around the culvert. Adjacent sediment-control structures such as silt fences, check dams, rock armoring, or riprap may be necessary to prevent erosion or sedimentation. Stream banks and approaches may be stabilized with rock or other erosion control devices.

Type 4 – Channel-spanning structures including fish passage

Crossing of a waterbody identified as containing a sensitive fish species that includes installation of a large-diameter culvert, arch culvert or short-span bridge and a stable road surface established over the structure for vehicle passage. Channel-spanning structures would be designed and installed under the guidance of a qualified engineer who, in collaboration with a hydrologist and aquatic biologist would recommend placement locations; structure gradient, height, and sizing; and proper construction methods. The typical disturbance footprint for channel-spanning structures averages 60 feet wide (along the waterbody) and 150 feet long (along the road) for 9,000 square feet, or 0.2 acre at each crossing.

Wetland Crossings with Access Roads

During construction and for routine and emergency operations, access across wetlands to individual structure locations may be necessary. Selection of final wetland crossing techniques would be based on final access road alignment and wetland characteristics. Techniques that would be considered include the following:

Constructing at-grade roads with geotextiles and road materials for water through-flow

This type of road would be below water during certain times of the year, which would make locating the roads difficult, and the depth of the water over the drivable surface may make travel over the submerged road surface impractical or not feasible.

Limiting structure access across wetlands to dry or frozen conditions, along with the use of low-ground-pressure tires or specialized tracked vehicles

Construction of ice roads in wetlands involves using lightweight equipment such as snowmobiles to tamp down existing snow cover and vegetation to allow penetration of frost into the wetland soils. This operation would be followed by packing with heavier tracked equipment such as Bombardiers or wide-tracked dozers. The window of weather cold enough to allow for this technique is short, thereby restricting operation and maintenance activities to the winter season only.

Installing temporary matting materials to allow access for heavy vehicles and equipment

The mats typically come in the form of heavy timbers bolted together or interlocking pierced-steel planks. Mats spread the concentrated axle loads from equipment over a much larger surface area, thereby reducing the bearing pressure on fragile soils. However, mats are less effective when standing water is present.

Constructing raised fill embankments for permanent above-grade access roads in wetlands such that the travel surface is higher in elevation than the ordinary high-water level

The construction of above-grade access roads would accommodate the types of equipment described above and would be the most flexible for construction. All waterbody and wetland disturbances would be completed under the terms of a USACE Clean Water Act Section 404 permit, the National Pollutant Discharge Elimination System Construction Stormwater Permit (Clean Water Act 402), an ODSL Removal-Fill Permit, and State 401 water quality certification requirements that govern activities within any waters of the United States. In Idaho, there is an additional requirement for a stream channel alteration permit.

Using helicopters for construction access to avoid wetlands

Transmission tower structures proposed for the B2H Project could be erected partially by helicopter, if needed. However, in each case, ground-based vehicles would still be needed and therefore would not eliminate the need for an access road to each structure to complete construction or to perform inspections and live-line maintenance activities. In sensitive resource areas, the agencies may require no access roads, access roads that are overland drive and crush only, or limited in the amount of improvement that will be allowed.

Multi-use Areas

Construction of the B2H Project would begin with establishing multi-use areas, which would serve as field offices; reporting locations for workers; parking space for vehicles and equipment; and sites for material delivery and storage, fabrication assembly of structures, cross arms and other hardware, concrete batch plants, and stations for equipment maintenance. Multi-use areas, each of which is about 30 acres in size, would be located approximately every 15 miles along the transmission line route. The layout of a typical multi-use area is illustrated in Figure 2-14. Multi-use areas may require an approved land-use permit through county planning departments. Some activities associated with the multi-use areas may require additional permitting. (For example, a concrete batch plant, depending on the zoning, may require a conditional use permit through the county planning department.)

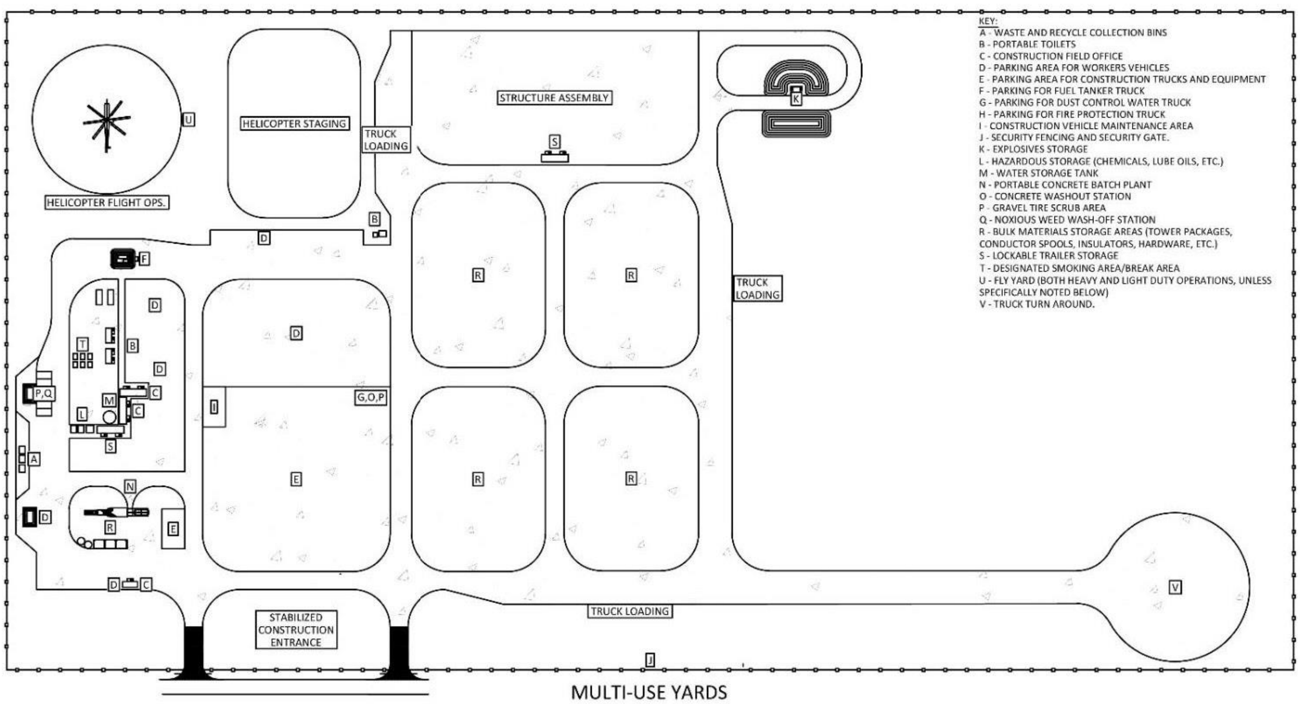


Figure 2-14. Layout of Multi-use Area

Helicopter operations may be staged from multi-use areas. Construction activities potentially facilitated by helicopters may include delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire-stringing operations. Helicopters also may be used to support the administration and management of the B2H Project by the Applicant, the construction contractor, or both. Where construction access by truck is not practical due to steep terrain, all-terrain-vehicle trails may be used to support maintenance activities. The use of helicopter construction methods for the B2H Project would not change the length of the access-road system required for operating the B2H Project because vehicle access is required to each structure site regardless of the construction method employed. During construction, gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents would be stored at multi-use areas. These products would be used to fuel, lubricate, and clean vehicles and equipment and would be transported to multi-use sites in containerized trucks or in other federally or state-approved containers. Enclosed containment would be provided for petroleum products and wastes and petroleum-related construction waste would be removed to a disposal facility authorized to accept such materials. Fuel and chemicals would be properly stored to prevent drainage or accidents. Where required, preventive measures, such as the use of vehicle drip pans for overnight parking areas, may be implemented. Routine visual inspection for presence of petroleum leaks would be required for vehicles. Diesel fuel tanks would be located at the multi-use areas for vehicle and equipment fueling. Each fuel tank would be located within secondary containment and each station would be equipped with a spill kit. When refueling on right-of-way is necessary, refueling would take place away from waterways. Accidental release of hazardous materials would be prevented or minimized through proper containment of these substances during use and transportation to the site. A Spill Prevention, Containment, and Countermeasure (SPCC) Plan would be prepared for all hazardous materials. All hazardous and dangerous materials would be stored and secured in accordance with the appropriate regulations.

During operations, no fuels or potentially hazardous, such as general lubricants, general cleaners, ethylene glycol (antifreeze), vehicle fuel, and herbicides for weed control would be stored on the right-of-way. When used, they would be transported and disposed of in accordance with applicable local, state, and federal environmental laws and regulations, and product labels as appropriate. At the communication stations, liquid propane would be stored in approved tanks.

Multi-use areas typically would be fenced and their gates locked. Security guards would be stationed where needed. In some cases, the multi-use area may need to be scraped by a bulldozer and a temporary layer of rock laid to provide an all-weather surface. Unless otherwise directed by the landowner, the rock would be removed from the multi-use area upon completion and the area would be restored.

PULLING-AND-TENSIONING SITES

Pulling-and-tensioning sites would be required every 1.5 to 2.0 miles along the right-of-way and at angle points greater than 30 degrees, and would require approximately 5 acres at each end of the wire section to accommodate required equipment.

The pulling-and-tensioning sites for the potential 230-kV and 138/69-kV line relocation and the 230-kV double-circuit line (to replace the BPA 69-kV line) would be required approximately every 1 to 2 miles along the right-of-way and would require approximately 1.2 acres each to accommodate required equipment.

Equipment at sites required for pulling-and-tensioning activities would include tractors and trailers with spooled reels that hold the conductors and trucks with the tensioning equipment.

A few pulling-and-tensioning sites are designated as light-duty fly yards. Light-duty fly yards are similar to the fly yards located in the multi-use areas but are smaller in size (Figure 2-15). All the equipment and activities that occur at a multi-use area also may occur at a light-duty fly yard. The exception would be that no oil and gas or explosive storage would occur and no batch plants would be located at the light-duty fly yards within the pulling-and-tensioning sites. The light-duty fly yards would be located within specific pulling-and-tensioning sites along the B2H Project where the spacing between multi-use areas is too great. The light-duty fly yards would be approximately 5-acre sites spaces approximately 15 miles apart.

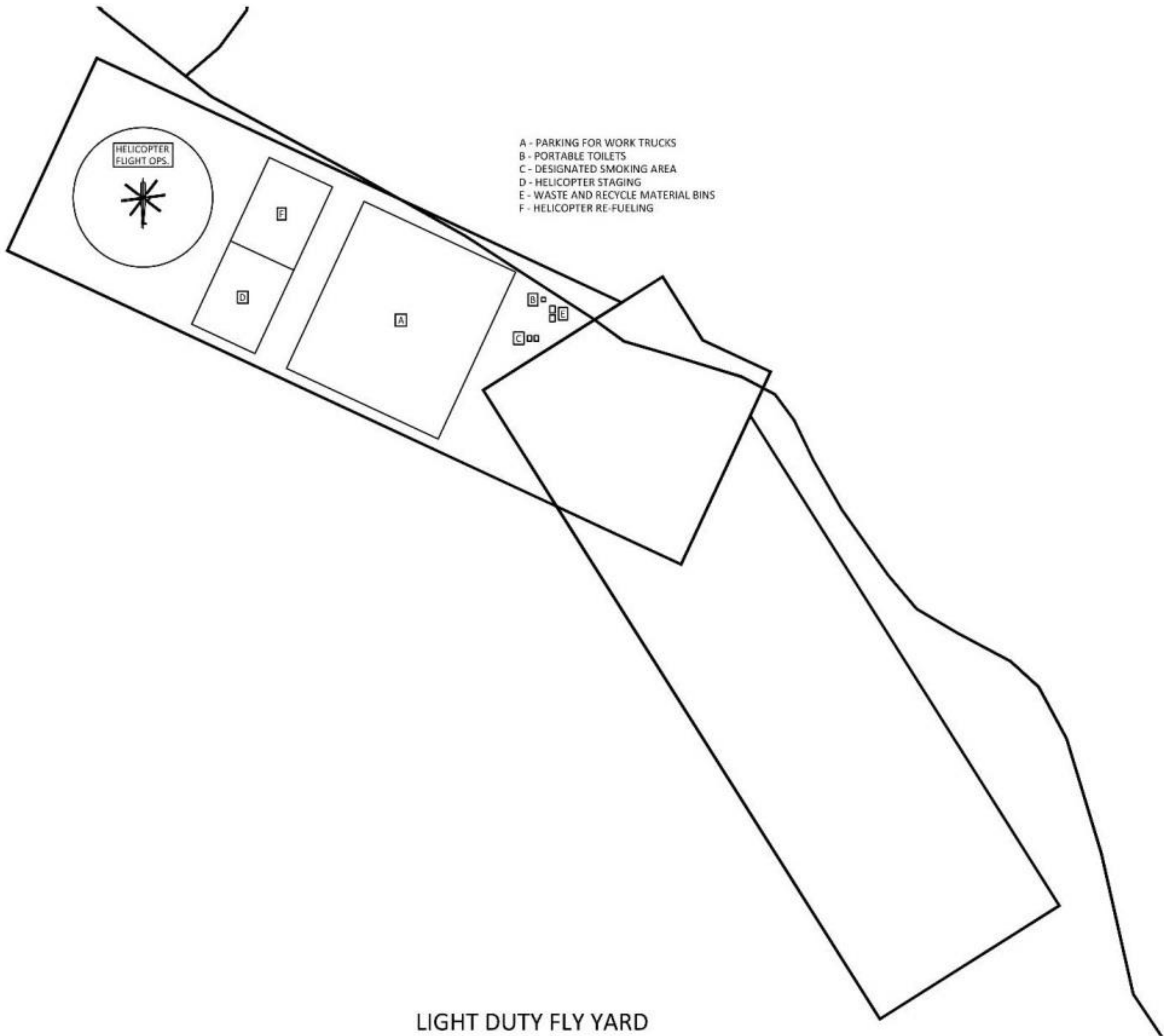


Figure 2-15. Layout of Light-Duty Fly Yard on Pulling-and-Tensioning Site

2.3.2 SYSTEM CONSTRUCTION

The following section and subsections describe the activities that would be associated with construction, operation, and maintenance of the B2H Project, including environmental compliance, geotechnical investigation, construction schedule and seasons, and typical construction, operation, and maintenance activities.

Design, construction, operation, and maintenance of the B2H Project would meet or exceed requirements of the NESC, U.S. Department of Labor, Occupational Safety and Health Administration standards, and the Applicant's requirements for safety and protection of landowners.

The activities described in this section would be refined during detailed design and engineering once a route has been selected for construction. Refinements would be either (1) consistent with the outcome of the impact assessment and mitigation planning disclosed in this EIS or (2) additional NEPA review would be required.

2.3.2.1 Environmental Compliance

Once a route is selected for construction and prior to commencement of construction, the POD—a detailed plan for construction, operation, and maintenance of the B2H Project—would be completed by the Applicant in collaboration with the agency interdisciplinary team and cooperating agencies.

The POD provides the direction to the Applicant's construction personnel, construction contractors and crews, compliance inspection contractor, environmental monitors, and agency personnel regarding specifications for construction. The POD also would provide direction to the agencies and the Applicant's personnel for operation and maintenance of the B2H Project. The POD provides background information including description of construction, operation, and maintenance activities; description of the Applicant's and agencies' roles and responsibilities; and description of environmental protection measures (e.g., design features of the B2H Project for environmental protection [Table 2-7, Section 2.3.4], selective mitigation measures [Table 2-13, Section 2.5.1.1]), and several implementation plans (Table 2-3). The final Applicant compensatory mitigation plan also would be part of the final POD.

To enable the affected federal agencies to approve and sign the ROD(s) and grant right-of-way, the POD must be substantially developed to a level of completion to satisfy the NEPA. Since design and engineering of the B2H Project will not be completed at the time of the ROD, the draft POD will be based on the information and data, including design features and mitigation measures, carried forward from the EIS, and the final Applicant's compensatory mitigation plan. Completion of the POD would be a condition of signing the ROD(s) and granting any federal land-use authorization. Notice to proceed with construction would not be issued until the stipulations of the right-of-way grant and approved final POD are satisfied. Other agencies also would condition their final authorizations (e.g., special use authorization) on completion of an acceptable POD, including an approved compensatory mitigation plan.

A preliminary POD submitted in November 2011 contains the framework of 12 implementation plans that include proposed design features and mitigation measures to reduce or avoid environmental impacts (unless otherwise directed by private landowners) (Idaho Power Company 2011). These framework plans are briefly described in Table 2-3.

Table 2-3. Framework Plan Descriptions

Framework Plan	Description
Framework Blasting Plan	Includes types of explosives and storage and security, as well as general use of explosives including the procedures and safety measures for blasting activities and notification requirements
Framework Reclamation Plan	Includes site-specific construction mitigation, reclamation, and revegetation measures for each land management area crossed by the right-of-way within BLM-managed, National Forest System lands, and other federal lands. It would combine the Applicant's environmental protection measures with site-specific mitigation developed in consultation with the BLM, U.S. Forest Service (USFS), and other federal agencies. Some measures would apply project wide, while others would be designed for specific areas. These measures also would apply to state and private land.
Framework Plant and Wildlife Conservation Measures Plan	Presents the measures proposed by the Applicant for avoidance and minimization of impacts on special status plant and wildlife species as related to construction activities for the B2H Project and would outline specific conservation measures to be implemented if state or federally listed species, BLM-sensitive species, or USFS special status species or their habitats are identified within or adjacent to the B2H Project right-of- way.
Framework Agricultural Protection Plan	Includes measures intended to mitigate or provide compensation for agricultural impacts that may occur due to construction of the B2H Project. The measures are intended to be implemented on partially or wholly owned private agricultural land unless directed otherwise by the landowner. Agricultural land will be defined to include that which is annually cultivated or rotated cropland; land in perennial field crops, orchards, or vineyards; land used for small fruit, nursery crops, greenhouses, or Christmas trees; improved pasture; hayfields; and land in the Conservation Reserve Program.
Framework Fire Prevention and Suppression Plan	Includes measures to be taken by the Applicant and its contractors to ensure that fire prevention and suppression are carried out in accordance with federal, state, and local regulations. The plan would address the specific requirements of the USFS and BLM handbooks, and provide environmental protection measures for fire management on privately owned lands. Measures would be identified in this plan that apply to work within the B2H Project area defined as the right-of-way, access roads, all work and storage areas (whether temporary or permanent), and other areas used during construction and operation of the B2H Project.
Framework Operations, Maintenance, and Emergency Response Plan	Includes measures to be employed while conducting routine, corrective, and emergency operations and maintenance activities. Measures identified would be in compliance with applicable state and federal laws and policies; would ensure consistency across and within federal jurisdictions; and would allow for the Applicant to access the transmission line and ancillary facilities in a timely, cost-effective, and safe manner. These measures also would apply to state and private land. At the end of the useful life of the B2H Project, if the facility is no longer required, the transmission line would be removed from service. Before removal, a decommissioning and restoration plan covering planned activities would be prepared for review and approval, and the appropriate level of NEPA analysis would be conducted.
Framework Traffic and Transportation Management Plan	Includes measures that require compliance with federal policies and standards relative to planning, siting, improvement, maintenance, and operation of roads for the B2H Project. These measures also would apply to state and private land.

Table 2-3. Framework Plan Descriptions	
Framework Plan	**Description**
Framework Stormwater Pollution Prevention Plan	Includes measures for temporary and permanent erosion and sediment control that would be used during construction, operation, and maintenance of the transmission line and ancillary facilities.
Framework Spill Prevention, Containment, and Countermeasures Plan	Includes measures for spill prevention practices, requirements for refueling and equipment operation near waterbodies, procedures for emergency response and incident reporting, and training requirements.
Cultural Resources Protection and Management Measures	Includes the procedures undertaken to inventory, evaluate, and protect cultural resources. It describes the treatment of any eligible or listed resource that cannot be avoided, and procedures for handling inadvertent discoveries during construction, operation, and maintenance. These may include, but not limited to, the Programmatic Agreement, Historic Properties Management Plan, and Inadvertent Discovery Plan.
Visual Resources Protection Plan	Includes measures for minimizing visual impacts and address specific BLM and USFS Visual Resource Management program requirements, and other applicable standards. These measures also would apply to state and private land.
Biological Resources Habitat Protection and Monitoring Plan	Includes specific conservation measures to be implemented in the event state or federally listed species, BLM-sensitive species, or USFS-sensitive species are identified along the B2H Project route during surveys. Measures identified in the plan would be specific to the protection of these species and take priority over measures identified in other plans. (May include a nest Management Plan and Adaptive Management Plan)
Mitigation Framework	Includes compensatory mitigation actions for reasonably foreseeable remaining effects (i.e., residual effects) on important, scarce, or sensitive resources from the B2H Project.
Table Source: Revised POD (Idaho Power Company 2011).	

The Applicant would be responsible for ensuring that its contractors and employees implement the design features, mitigation measures, and framework plans. The federal agencies with jurisdictional responsibilities would monitor for implementation of the design features, mitigation measures, and framework plans. For this monitoring, the agencies would use a compliance inspection contractor (CIC) to ensure that the measures prescribed in the EIS and final POD are implemented and are achieving the desired resource protection results on lands of all jurisdictions.

For some resources, such as biological and cultural resources, pedestrian surveys using agency-approved protocols would be required prior to construction. The survey plans would be based on the final design of the B2H Project. The survey results would be reviewed and approved by the agencies and then used by the agencies to refine the mitigation requirements and further inform the final POD.

As mentioned, the POD would be developed by the Applicant in collaboration with the agency interdisciplinary team and cooperating agencies consisting of federal, state, and county agencies having jurisdictional or regulatory responsibilities and/or specialized knowledge for the B2H Project. Although the federal agencies do not have authority over state or private land, the federal agencies have an obligation to disclose in the EIS the consequences on nonfederal lands from their decisions. However, the federal agencies have an obligation to enforce the requirements of the National Historic

Preservation Act and the ESA to protect important historic properties and threatened and endangered species, respectively, regardless of land jurisdiction or ownership.

The provisions of the POD would be applied to federal land, state land, and private land, as required by state law or through private landowner easement negotiations. Documentation of state or landowner decisions regarding the provisions of the POD would be documented and provided to the CIC as a variance. Participation in the development of the POD by state and county cooperating agencies would give them the opportunity to concur with and adopt the terms and conditions of the POD to facilitate state and county licensing or permitting. For the B2H Project, a draft POD that is based on information and data carried forward from the EIS would be required as a condition of signing the ROD. This POD would be incorporated by reference into the ROD, and issued based on the analysis in this EIS. Any refinements in the POD that are consistent with the impacts analysis in the EIS would not require a supplemental EIS.

When resource pedestrian surveys have been completed and the resulting reports have been approved by the agency (or agencies) responsible for overseeing the surveys, refinements to environmental protection measures in the final POD would be incorporated and the agencies would be asked to review the refined, final POD. The approved, final POD is a requirement to receive a notice to proceed for any surface disturbance and would be referenced in any federal right-of-way grant, special-use authorization, license agreement, etc. Thereby, the Applicant agrees to be bound by all terms and conditions, stipulations, and mitigation, including a compensatory mitigation plan, prescribed in such documents. Any change to the POD after issuance of the notice to proceed would require review and approval through the variance process described in the POD or, if the change is not within the analysis for the B2H EIS or other NEPA document, additional NEPA analysis may be required.

2.3.2.2 Land Requirements and Construction Disturbance

The Applicant proposes to acquire a permanent 250-foot-wide right-of-way for the 500-kV single-circuit sections of the proposed B2H Project, except along the west side of Bombing Range Road where a 90-foot-wide right-of-way is needed, a 125-foot-wide right-of-way for the 230-kV transmission line relocation and a 100-foot-wide right-of-way for the 138/69-kV transmission line relocation and rebuild. The right-of-way widths are based on maintaining sufficient clearance during a high wind event when the conductors could be blown toward the right-of-way edge and on providing sufficient space within the right-of-way to perform transmission line maintenance. For the purposes of assessing impacts, it is assumed that all areas within the right-of-way could be disturbed temporarily during construction.

During construction a temporary easement (for private lands) or short-term right-of-way would be required from landowners and land-management agencies for temporary disturbance. Temporary disturbances, such as material laydown yards, helicopter fly yards, and concrete batch plants, only occur during construction. The land area needed for operations would be smaller than the area needed during construction, because permanent disturbances for the proposed transmission line would be limited to tower pads, communications sites, and access roads. These areas are typical, and the actual land areas needed for construction and operation of the B2H Project would be determined during final engineering. Design features, best management practices, and selective mitigation measures would be included in the preliminary POD and attached to the ROD and if appropriate, included in any subsequent right-of-way grant or special-use authorizations issued for the B2H Project. The final POD would be completed and approved when final engineering is complete and all environmental pedestrian surveys are complete and approved by regulatory agencies**.** A notice to proceed would be required prior to any surface-disturbing activity.

2.3.2.3 Geotechnical Investigation

Geotechnical investigations would be conducted within the transmission line right-of-way. The purpose of the geotechnical investigation is to collect information regarding subsurface stability, which would be used in the final design of each transmission structure and foundation to ensure the system is designed and constructed to be safe, reliable, and cost efficient.

The geotechnical investigations would consist of boring and sampling soils to a typical depth of 50 to 60 feet below the ground surface; however, some borehole depths may exceed 60 feet depending on local soil conditions. The boreholes would have a diameter of approximately 8 inches and typically would be backfilled with boring cuttings from the borehole and on-site soils. About 70 boreholes would be spaced approximately 3 miles apart. Geotechnical investigations would use existing access roads and overland access routes as identified in the preliminary POD.

Helicopter-transported drill rigs may be used for geotechnical exploration in areas where existing roads do not provide adequate access or where overland travel is prohibited. Geophysical exploration techniques may be employed in areas where drilling is impractical to assist in subsurface characterization. Geophysical exploration techniques use surface vibration and instrumentation to identify subsurface soil and rock layers.

The Applicant has conducted a preliminary geotechnical desktop study. In the final geotechnical investigation program for the transmission line, areas of concern identified in the preliminary geotechnical desktop study would be field-reviewed to determine validity of the data sources used in the study's report. Borings would be planned according to the Applicant's geotechnical investigation standards, with additional boring locations dictated by geotechnical desktop study. Certain boring locations may be eliminated if it is determined that soil conditions would not vary or borings from adjacent transmission lines could be used for design. Geotechnical investigation for the B2H Project is anticipated to consist of site examinations, geotechnical drilling, select geophysical surveys, and laboratory testing.

The Applicant would prepare a more detailed summary of the anticipated boring program, which would be reviewed and approved by the BLM and applicable agencies for sufficiency of biological and cultural surveys and approvals prior to issuance of any short-term right-of-way grant or use authorization. The detailed summary of the anticipated boring program would include the following:

- Land ownership
- Site substantiated access information

- Anticipated drill rig type and drilling method
- Anticipated soil types and subsurface lithology
- Anticipated access requirements

GEOTECHNICAL DRILLING ACTIVITIES

Drilling equipment is commonly mounted on road-legal two-wheel-drive and four-wheel-drive trucks, tracked vehicles, oversized-tire all-terrain vehicles, or platform rigs. The type of drilling rig used is dependent on the access difficulties to the boring location and the sampling methods required. Platform rigs can be transported in pieces to the site via helicopter. Other vehicles and equipment normally mobilized to each boring location include a water truck and/or support vehicle, large air compressor, geologist's pickup truck or utility vehicle, and possibly another support truck. Table 2-4 is a summary of the geotechnical drilling activities, methods, and equipment that could be used during the geotechnical investigations.

Table 2-4. Summary of Geotechnical Drilling Types, Methods, and Equipment

Drilling Type	Drilling Method	Support Equipment
Hollow-stem auger	Dry (mechanical)	Drill rig, vehicle for rods and equipment, track-mounted water truck, crew vehicle
Mud rotary	Wet (pumped water)	Drill rig, vehicle for rods and equipment, water truck, crew vehicle[1]
Air rotary	Dry (compressed air; air hammer)	Drill rig, vehicle for rods and equipment, towed air compressor, crew vehicle
Sonic	Dry (sonic vibrations)	Drill rig (larger than others), vehicle for rods and equipment, crew vehicle
Under-reamer (ODEX System)	Dry (compressed air; air hammer)	Vehicle for rods and casing, air compressor, crew vehicle
Cone penetration test	Dry	Truck or track-mounted all terrain rig, support truck for equipment, crew vehicle

Table Note: [1]For the construction of the B2H Project, the Applicant has committed to using water that would be procured from existing municipal sources, from commercial sources, or under a temporary water-use agreement with landowners holding existing water rights.

2.3.2.4 CONSTRUCTION SCHEDULE AND SEASONS

The Applicant would be ready to mobilize once notices to proceed are issued. Final engineering surveys, coordinated with landowners, and detailed design would determine the exact locations of towers, access roads, and other B2H Project features before the start of construction, and would be included in the final POD. The Applicant plans to hire contractors to complete construction work in accordance with agency requirements and industry performance standards. The overall construction period, including construction of access roads, transmission line, substation facilities, and post-construction clean-up, would be approximately 3 years from receipt of a notice to proceed, depending on a number of factors such as weather, seasonal restrictions, and availability of labor and materials.

The B2H Project would be built in two sections or "spreads," both spreads would be under construction concurrently.

Although the construction rate of progress would be reduced in the winter, the Applicant has planned an aggressive schedule, and it is anticipated that construction would continue through the winter months in the lower-elevation areas, as weather permits. In the higher-elevation areas, winter storms and snow would limit access to the right-of-way; for example, in the Blue Mountains. In these areas, it is expected that construction would be suspended on some portions of the right-of-way during the peak winter months and construction resources would be either demobilized or shifted to other areas of construction. Design features to address wet and winter conditions are and will be addressed further in the POD.

Environmental issues such as seasonal use of wildlife ranges, nesting, soil and water conditions and others also may affect construction scheduling. Seasonal restrictions on construction activity would be implemented, unless specific exemptions are granted in an Adaptive Management Plan, in accordance with agency policy and management plans, to avoid and minimize effects on wildlife. Potential seasonal restrictions and buffers vary by species and are described in Appendix B of this EIS and the wildlife, fish, and vegetation subsections of Chapter 3. As required, biological surveys for sensitive species would be conducted and survey results and mitigation recommendations would be approved before construction activities commence. Data gathered through these surveys would be used to determine the site-specific buffers and seasonal restrictions to implement. Approval to proceed would be granted through a notice to proceed.

2.3.2.5 Right-of-Way and Site Preparation

Within the right-of-way, vegetation would be removed to the extent needed to ensure adequate ground clearances. Individual trees and snags (hazard trees) that pose power-outage or fire risks to conductors or structures also would be removed. Felled trees and snags would be left in place as sources of large woody debris in and/or near waterways, as habitat or to meet other resource needs. Felled green trees would be limbed to reduce fire hazards (Figure 2-16). All timber cleared from the right-of-way on National Forest System land would be cut and cleared in accordance with standards and guidelines in the Wallowa-Whitman LRMP.

Installation of transmission line structures would require preparation of each site where a tower structure would be installed, including vegetation removal and grading to the extent needed to obtain a relatively flat surface for the operation of large cranes, which are generally used to install structures. The use of helicopters for assisted aerial construction may be required depending on overland access to the construction locations, construction schedule, and/or construction economics (Idaho Power Company 2011).

Individual structure sites would be cleared to install the transmission line support structures and facilitate access for future transmission line and structure maintenance. Clearing individual structure sites would be done using a bulldozer to blade the required area. At each 500-kV lattice-structure location, an area approximately 250 feet by 250 feet would be needed for construction laydown, structure assembly, and erection. This area would provide a safe working space for placing equipment, vehicles, and materials. The work area would be cleared of vegetation only to the extent necessary.

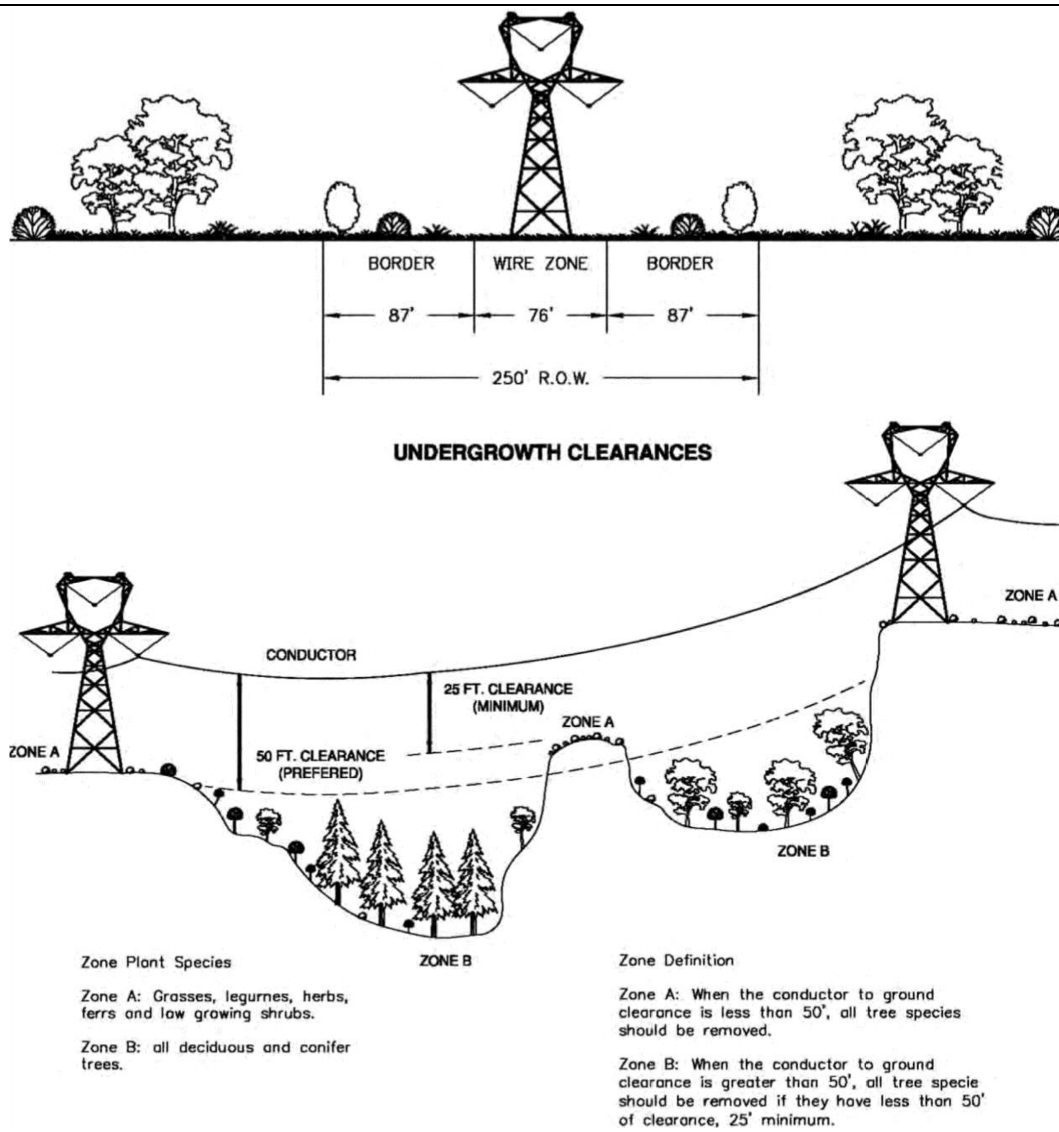


Figure Source: Revised POD (Idaho Power Company 2011)

Figure 2-16. Right-of-Way Vegetation Removal and Management

At each 230-kV H-frame structure location, an area approximately 100 feet by 150 feet (i.e., two-pole H-frame) would be needed for construction and laydown, structure assembly, and erection.

At each 138/69-kV structure location, an area approximately 100 feet by 100 feet would be needed for construction and lay down, structure assembly, and erection.

If an alternative route involving the option on the west side of Bombing Range Road is selected for construction, removal of the BPA 69-kV transmission line structures would be completed using two methods. The majority of the structures would be removed by taking down the overhead conductor and removing each of the wooden poles at 3 inches below ground surface. The poles would be lifted by crane onto trucks and removed from the site using existing access roads to the maximum extent possible. Removal of three of the H-frame structures that are located in Washington ground squirrel habitat would be removed by cutting the poles into sections, transporting the pole sections by foot to the nearest existing road, and driving the pole section off site. The construction contractor would climb the poles and remove sections starting at the top. The poles would be removed down to slightly below ground level to eliminate potential raptor-perching structures while avoiding ground disturbance. The below-grade portions of the poles would be left in place. Alternately, the wooden-pole structures could be removed by using a helicopter in conjunction with hand crews working on the ground.

After construction, areas not needed for normal transmission line maintenance, including fire and personnel safety clearance areas, would be graded to blend as nearly as practicable with the natural contours, and then revegetated as required.

Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock. Excess rock that is too large in size or volume to be spread at the individual structure sites will be hauled away and disposed of at approved landfills or at a location specified by the landowner. Table 2-2 provides the dimensions of each of the foundation holes required for each structure.

2.3.2.6 Transmission Line Construction

Various construction activities would occur during the construction process, with several construction crews operating simultaneously at different locations. Figure 2-17 illustrates typical transmission line construction activities.

Foundations would be installed—one foundation for each of the four legs of the lattice tower structures, two or three foundations for the tubular H-frame structures, and one foundation for single-pole structures. Medium- and large-angle H-frames and dead-ends would require three-pole structures. Table 2-2 details foundation dimensions and the amount of concrete needed for each structure type.

If shallow bedrock is encountered, blasting could be required. The construction contractor would be required to prepare a blasting plan as part of the POD (refer to Table 2-3), which details blasting procedures, locations, the amount and type of explosives, safety procedures, and notification protocols. After foundations are installed, and the concrete has had time to cure, the structures would be brought in by either truck or helicopter.

The transmission line structures would be assembled on site or in temporary staging areas (laydown yards) and then would be brought to the site to be erected. If ground transportation is used, cranes would be used to lift and install the structures.

If helicopters are used, the tower structures would be assembled at fly yards. After assembly at the fly yard, the tower sections would be airlifted to the structure location where the sections would be bolted together permanently. The fly yards would be approximately 10 to 15 acres and sited at locations within 4 to 8 minutes of fly time to structure locations.

After assembly and placement of the structures, the conductors and the overhead ground wires would be strung from tower to tower. Figure 2-18 illustrates typical conductor installation. Helicopters are used to assist in the wire installation process but may not be necessary if access roads are available along the right-of-way from tower to tower allowing specialized wire-stringing vehicles in the area. The first step to wire stringing would be to install insulators and stringing sheaves. Once in place, the initial stringing operation begins with the pulling of a lightweight "sock" line through the sheaves. A specialized stringing vehicle is used to pull the lines.

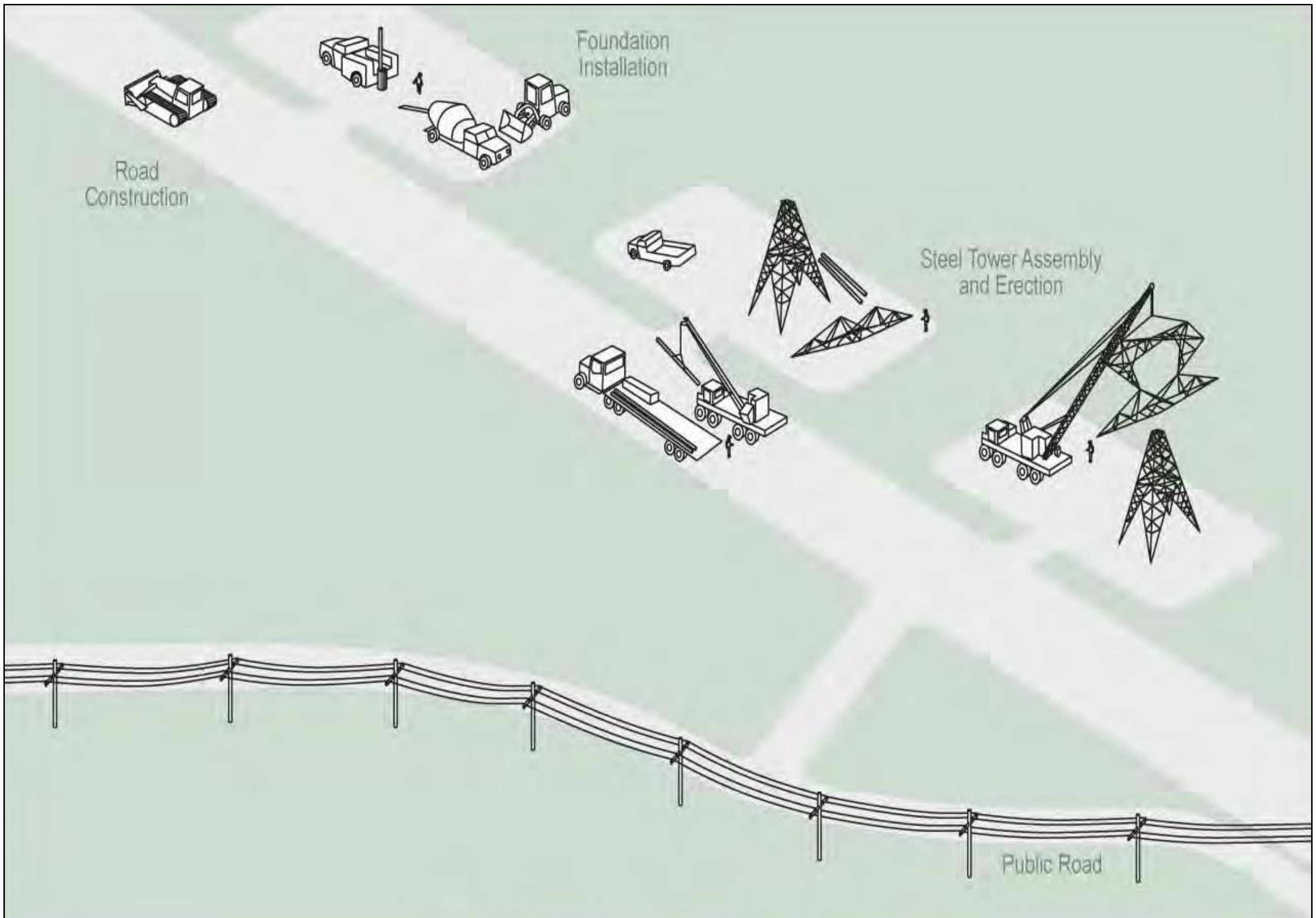


Figure Source: Revised POD (Idaho Power Company 2011)

Figure 2-17. Typical Transmission Line Construction Activities

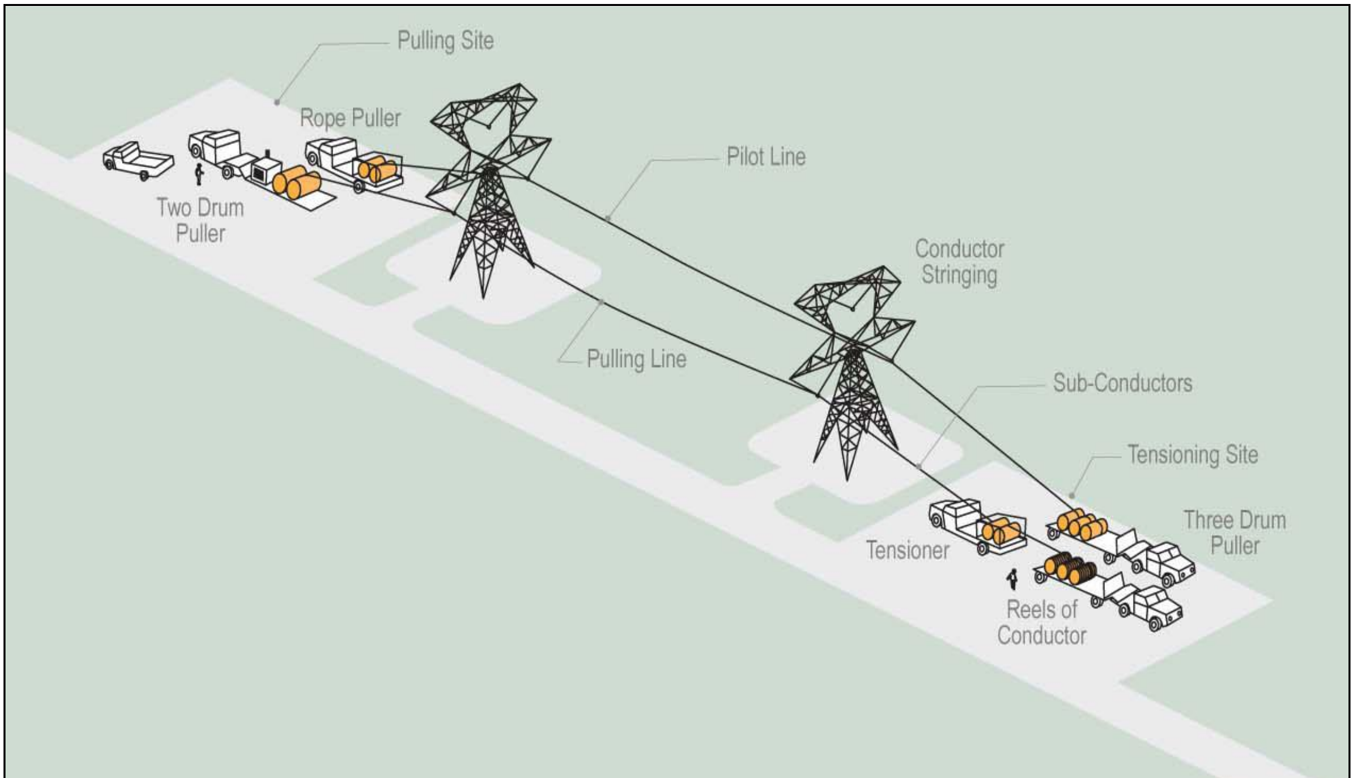


Figure Source: Revised POD (Idaho Power Company 2011)

Figure 2-18. Typical Conductor Installation

Compression or implosive devices are both used to make connections between conductors. Implosive devices are the current industry-preferred method in contrast to previously used conventional hydraulic compression fittings. Implosive fittings use explosives to compress the metal together. Implosive fittings do not require heavy equipment, but do create noise similar to a gunshot when the primer is struck. Compression fittings, dead-ends or splices, are crimped on over the conductor. Normal compression fittings need an engine, typically truck-mounted diesel, to run the hydraulic system. Implosive fittings may be set off either one at a time or in groups. Use of implosive devices would vary depending on what segment of the transmission line is under construction and the number of conductors per bundle. The duration of sound emitted from detonation of an implosive device is short, ranging from approximately 210 to 360 milliseconds. Since the potential exists for noise “startle” effects, the use of implosive devices would be limited to daytime periods. As stated previously, a B2H Project-specific blasting plan, for blasting and implosive splicing, which meets all state and federal requirements, including seasonal restrictions and buffer distances, would be developed and approved by the appropriate agency or agencies (e.g., the BLM, USFS, USFWS, NOAA Fisheries) prior to the start of field activities for inclusion in the POD, and would be executed appropriately for the B2H Project. No in-water blasting would occur as part of the B2H Project.

Following the initial pulling of the wire through the sheaves, the wire is then tensioned to the correct sag between support structures. Temporary pulling-and-tensioning sites for the 500-kV line construction would be spaced approximately 1.5 to 2 miles apart along the right-of-way and each would require approximately 5 acres for equipment and work space. Pulling-and-tensioning sites for the 230-kV and 138/69-kV lines would be spaced approximately every 1 to 2 miles along the right-of-way and would require approximately 1.2 acres for equipment and work space.

2.3.2.7 Access Roads

Access and service roads are essential for construction, operation, and maintenance of the transmission line. Large foundation-auger equipment, heavily loaded trucks, cranes, and specialized line-construction equipment would be required for construction, maintenance, and emergency restoration activities. Existing roads, existing roads that require improvements, and new roads would be needed for the B2H Project. To the extent possible, existing roads would be used in their present condition without improvements. In areas where improvements would be required or deemed to be in the best interest of the B2H Project for future operation and maintenance use, the roads would be graded and/or graveled to provide a smooth all-weather travel surface. The Applicant would coordinate with the land-managing agency or owner regarding road improvements needed.

Construction Access Roads

During construction, vehicular access would be required to each structure. New access roads would be constructed and existing roads widened as needed to provide a minimum of a 14-foot-wide travel way. Roads not required during operation would be restored to as close to their original condition as practicable or left as is, depending on landowner/land-management-agency requirements.

Access on the right-of-way, other than in specific areas, would require a travel surface with a minimum width of 14 feet. In some cases, new roads that must be graded for access along steep slopes (side-hill roads) could exceed this width depending on the amount of displaced soil. These roads typically go directly from structure to structure, except on hillsides, ridgebacks, rock-outcrop areas, wash crossings, treed areas, or in areas where sensitive environmental resources would need to be avoided. In such cases, the road would follow suitable topography from structure to structure, would be constructed in areas that generally cause the least amount of overall disturbance, and may be outside the transmission line right-of-way.

The largest of the heavy equipment needed dictates the minimum road dimensions needed. To accommodate this equipment, road specifications require a 14-foot-wide travel surface and a 16- to 35-foot-wide road width in turns. The road disturbance area and travel way in areas of rolling to hilly terrain would require wider disturbance to account for cuts and fills, turning radii, and/or where vehicles are required to pass one another while traveling in opposite directions.

Specific plans for the construction, rehabilitation, and/or maintenance of roads, including the locations of access roads would be documented in the final POD described in Section 2.3.2.1. The locations and design of B2H Project access roads (and other facilities) would be completed when a route has been selected for construction and final design and engineering completed. For purposes of analyzing effects from access roads for the EIS, ground disturbance associated with upgrading existing roads or constructing new roads was estimated through development of a predictive model that considers different types or levels of access required. This model is described in more detail in Section 2.5.1.1 under the subheading Impact Assessment and Mitigation Planning.

Operational Access Roads

Permanent transmission line service roads developed for the B2H Project are needed for maintenance of transmission lines structures or ancillary facilities. These roads built for the B2H Project generally would be closed to the public and maintained by the Applicant for administrative use only and/or in accordance with the land-managing agency's policy and or management prescription. Gates would be maintained by the Applicant in an operable manner and secured with dual locks, where applicable, to allow the land-managing agency or owner access for emergencies. All gates installed on National Forest System lands would have reflective markings I accordance with USFS Engineering Manual EM 7100-15.

During routine operations, vehicular access would be needed to reach each structure for periodic inspections and maintenance and to areas of forest or tall shrubs to control vegetation in the right-of-way for safe operation. The Applicant plans to employ live-line maintenance techniques, which requires use of high-reach bucket trucks and other trucks and equipment. For nonroutine maintenance requiring access by larger vehicles, the full width of the access road (14 feet) may be used. Roads would be repaired, as needed, but would not be graded routinely. Best management practices would be applied to be consistent with local conditions, values, and designated uses of water. To preserve the ability to enter rapidly, the road structure (cuts and fill) would be left in place. In an emergency (e.g., in the event of a structure or conductor failure) full emergency access, including cranes and other heavy equipment, would be needed. Based on historical reliability of the lattice and H-frame structures, it is anticipated that only a small fraction of the structure sites would require emergency access during the life of the B2H Project.

2.3.2.8 Communications System

Fiber-optic cable for the communications system would be installed concurrently with stringing the conductors. Construction of communications sites would begin with grading the selected area, removing vegetation, and installing a layer of crushed rock. A prefabricated concrete communications shelter approximately 12 feet by 32 feet by 9 feet tall would be constructed on the site. A standby generator with a liquid petroleum gas fuel tank would be installed at the site inside the fenced area. Two cable routes (aerial and/or buried) from the transmission line structure to the equipment shelter would be installed (Idaho Power Company 2011). Typical layout of a communication site is illustrated in Figure 2-13.

Access roads to communications stations would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or off site. Typically, gravel would be applied to the prepared base layer (Idaho Power Company 2011).

2.3.2.9 Construction Workforce and Equipment

The B2H Project would be constructed primarily by contract personnel; the Applicant would be responsible for administration and inspection. The construction workforce would consist of laborers, craftspeople, supervisory personnel, support personnel, and construction management personnel who would perform the construction tasks. The B2H Project is proposed to be constructed in two geographic segments, within which a complete construction sequence would be conducted. The boundaries of the construction segments have not been finalized, but the northern construction segment would likely include Morrow, Umatilla, and Union counties and the northern portion of Baker County, and the southern construction segment would likely include the southern portion of Baker County, Malheur County, and Owyhee County. Both construction segments are planned to occur simultaneously and are anticipated to take approximately 3 years to complete. The projected number of construction workers and anticipated changes to the population of the B2H Project area are summarized by construction segments in Table 2-5.

Table 2-5. Projected Number of Workers and Population Change During Peak Construction

Workers	Construction Segment 1	Construction Segment 2
Permanent workers likely to commute to job site daily	61	63
Temporary workers likely to move to B2H Project area alone	164	169
Temporary workers likely to move to B2H Project area with family	18	19
Total	243	251
Table Source: Revised POD (Idaho Power Company 2011).		

2.3.3 Operation and Maintenance

2.3.3.1 Land Requirements for Operations

During operations, land requirements would be restricted to the right-of-way, substations, communications facilities, and roads authorized by the right-of-way grant and special-use authorization. Approval for access across federal lands to the right-of-way would be contained in the right-of-way grant and special-use authorization. Access to the easement across nonfederal land would be in accordance with the land rights obtained by the Applicant as part of the easement acquisition process. As the engineering details of the B2H Project design are developed, the locations and areas of land needed for B2H Project operations may be revised, and would be specified in the final POD. Table 2-1 provides the approximate land areas that would be needed for construction and operations of the B2H Project throughout the life of the B2H Project.

2.3.3.2 Routine System Inspection, Maintenance, and Repair

The Applicant proposes specific operations and maintenance policies and procedures that are designed to meet the requirements of NERC, Western Electricity Coordinating Council, the state public utility commissions of Oregon and Idaho, and to comply with applicable codes and standards for maintaining the reliability of the electrical system. Operation and maintenance activities would include transmission line patrols, climbing inspections, structure and wire maintenance, insulator washing as needed, vegetation management, and access roads repair. Periodic inspection and maintenance is a key part of operating and maintaining the electrical system.

After the transmission line has been energized, land uses that are compatible with safety regulations would be permitted in and adjacent to the right-of-way. Existing land uses such as agriculture and grazing generally would be permitted within the right-of-way. Incompatible land uses within the right-of-way include construction of inhabited dwellings and any use requiring changes in surface elevation that could affect electrical clearances of existing or planned facilities.

TRANSMISSION LINE MAINTENANCE

Planned maintenance activities include routine patrols, inspections, scheduled maintenance, and scheduled emergency maintenance. Regular ground and aerial inspections would be performed in accordance with the Applicant's established policies and procedures for transmission line inspection and maintenance. Transmission lines and substations would be inspected for corrosion, equipment misalignment, loose fittings, vandalism, and other mechanical problems. Inspection of the entire transmission line system would be conducted semi-annually with detailed ground inspections using trucks or all-terrain vehicles taking place on an annual basis using service roads to each structure. Examples of routine maintenance include the following:

- Inspections from a helicopter
- Inspections from ground patrols
- Climbing structures to inspect hardware or make repairs
- Structure or conductor maintenance from a bucket truck
- Cathodic protection surveys
- Vegetation clearing to trim or remove shrubs and trees over 12 feet
- Removal of individual trees (hazard trees) that pose a risk to conductors or structures
- Routine road maintenance such as grading to improve surface condition and drainage, or removing rocks and debris
- Installation of bird protection devices, bird perch discouragers, and relocation or removal of bird nests as permitted.

Unplanned maintenance activities include emergency maintenance in cases where public safety and property are threatened. Unplanned maintenance activities and emergency maintenance and repair that could arise from the following:

- Lightning strike or wildfire
- Damage to structures from high winds, ice, or other weather-related conditions
- Line or system outages
- Breaking or eminent failure of crossarms or insulators
- Vandalism to structures or conductors

Routine maintenance activities are ordinary maintenance tasks that historically have been performed and are carried out on a routine basis. The work performed is typically repair or replacement of individual transmission line components and does not result in new ground disturbance. These maintenance activities typically are performed by relatively small crews using a minimum of equipment and usually are conducted within a period from a few hours up to a few days. Work requires access to the damaged portion of the line. Equipment required for this work may include four-wheel-drive trucks, flatbed trucks, bucket trucks (low reach), boom trucks (high reach), or manlifts. This work is scheduled and is typically in response to issues found during inspections. Typical items that may require periodic replacement on transmission line structures include insulators, hardware, or other structure members. It is expected that these replacements would be required infrequently.

Access Road and Work Area Repair

Repairs in the right-of-way may include grading or repair of existing maintenance access roads and work areas, and spot repair of sites subject to flooding or scouring. Required equipment may include a grader, backhoe, four-wheel-drive pickup truck, and a cat-loader or bulldozer. The cat-loader has steel tracks, whereas the grader, backhoe, and truck typically have rubber tires. Repairs in the right-of-way would be scheduled as a result of line inspections in response to an emergency situation.

Vegetation Management

The need for vegetation management also would be determined during inspection patrols.

Work areas adjacent to electrical transmission structures and along the right-of-way would be maintained for vehicle and equipment access. Shrubs and other obstructions would be removed near structures to facilitate inspection and maintenance of equipment and to ensure system reliability. At a minimum, trees and brush would be cleared within a 25-foot radius of the base or foundation of all electrical transmission structures and to accommodate equipment pads to conduct live-line maintenance operations.

Vegetation management practices along the right-of-way would be in accordance with the Applicant's clearing specifications and vegetation management plans, which would be consistent with the NERC's Vegetation Management Standards (FAC-003-2, 2009). The area that would be rights-of-way for the B2H Project are dominated by agricultural and shrub-steppe vegetation communities except for the approximately 5.9 miles in the designated utility corridor across the Wallowa-Whitman National Forest. Interference with conductors is not anticipated. However, if vegetation management is required, the Applicant generally would schedule it according to maintenance cycles (e.g., 5- or 10-year cycles).

A wire-border zone method is used to control vegetation. This method results in two zones of clearing and revegetation. The wire zone is the linear area along the right-of-way under the wires and extending 10 feet outside of the outermost phase conductor. After initial clearing, vegetation in the wire zone would be maintained to consist of native grasses, legumes, herbs, ferns, and other low-growing shrubs that remain under 5 feet tall at maturity. The border zone is the linear area along each side of the right-of-way extending from the wire zone to the edge of the right-of-way. Vegetation in the border zone would be maintained to consist of tall shrubs or short trees (up to 25 feet high at maturity), grasses, and forbs. These cover plants benefit the right-of-way by competing with and excluding undesirable plants. The width of the wire and border zones for the various transmission lines are depicted in Figure 2-16. During maintenance inspections, vegetation growth would be monitored and managed to maintain the wire-border zone objectives. The Applicant's approach is to remove all tree species within the right-of-way where the conductor ground clearance is less than 50 feet, leaving grasses, legumes, herbs, ferns, and low-growing shrubs within the right-of-way. When conductor ground clearance is greater than 50 feet; for example, a canyon or ravine crossing with high ground clearance at mid-span, trees and shrubs would be left in place as long as the conductor clearance to the vegetation tops is 50 feet or more (Figure 2-16).

Vegetation would be removed using mechanical equipment such as chain saws, weed trimmers, rakes, shovels, mowers, and brush hooks. Clearing efforts in heavy growth areas would use equipment such as a Hydro-Ax or similar. The duration of activities, the size of crew and required equipment depends on the amount and size of the vegetation to be trimmed or removed.

In selected areas, herbicides may be used to control noxious weeds. Herbicide applications would be performed in accordance with federal, state, and local regulations, and in compliance with managing land agency requirements.

Noxious Weed Control

The states of Idaho and Oregon list activities that are capable of disseminating noxious weeds and the requirements to control the spread of listed noxious weeds. Equipment and supplies necessary for transmission line construction and operation and maintenance activities, and the activities themselves, are possible agents for the spread of noxious weeds. Under the requirements of a right-of-way grant or special-use authorization, and privately negotiated easements, the Applicant would be responsible for control of noxious weed species that result or would result from construction, operation, and maintenance of the improvements authorized under the grant. Therefore, a noxious-weed-control strategy to reduce the opportunity for weeds to invade new areas and to minimize the spread of weeds within a predetermined area associated with the B2H Project is addressed in Appendix B2 of the POD, Framework Reclamation Plan, which complies with Oregon, Idaho, BLM, and USFS noxious weed requirements. However, cleaning stations may be needed closer to the potentially affected area. Noxious weed control is discussed in Section 3.2.3.

The responsible party would clean all equipment that may operate off-road or disturb the ground before beginning construction or operation and maintenance activities within a predetermined area associated with the B2H Project. This process would clean tracks and other parts of the equipment that could trap soil and debris and would reduce the potential for introduction or spread of undesirable exotic vegetation. Preferably, the cleaning would occur at an Idaho Power operation center, commercial car wash, or similar facility. Vehicles traveling only on established paved roads would not require cleaning.

Communication Site Maintenance

Maintenance activities for communication sites include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. Communication sites would be visited every 2 to 3 months by one individual in a light-duty truck to inspect the facilities. Annual maintenance would be performed by a two-man crew in a light-duty truck over a 2- to 5-day period.

Fuel and Chemical Storage Facilities

During construction, gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents would be present along the transmission line corridor, typically at multi-use areas, and at the Longhorn Substation construction site. These products would be used to fuel, lubricate, and clean vehicles and equipment and would be transported in containerized trucks or in other federal and state approved containers. Enclosed containment would be provided for petroleum products and wastes and petroleum-related construction waste would be removed to a disposal facility authorized to accept such materials. Fuel and chemicals would be stored properly to prevent drainage or accidents. Where required, preventive measures such as the use of vehicle drip pans for overnight parking areas may be implemented. Routine visual inspection for presence of petroleum leaks would be required for vehicles. Diesel fuel tanks would be located at the multi-use areas for vehicle and equipment fueling. Each fuel tank would be located within secondary containment and each station would be equipped with a spill kit. When on-right-of-way refueling is necessary, it would be done away from waterways. Accidental releases of hazardous materials would be prevented or minimized through proper containment of these substances during use and transportation to the site. A SPCC Plan will be prepared as part of the POD (refer to Table 2-3). All hazardous and dangerous materials would be stored and secured in accordance with the appropriate regulations.

During operations, no fuels or potentially hazardous materials such as general lubricants, general cleaners, ethylene glycol (antifreeze), vehicle fuel, or herbicides for weed control would be stored on the right-of-way. When used, they would be stored and disposed of in accordance with applicable local, state, federal environmental laws and regulations, and product labels where applicable. At the communication stations, liquid petroleum would be stored in approved tanks. Reactors at the termination station would be filled with an insulating mineral oil. Secondary containment structures would be installed to prevent oil from this equipment from reaching ground or water bodies in the event of a rupture or leak. IPC would use a standard type of oil containment consisting of a pit of a calculated capacity under the oil-filled equipment that has an oil-impervious liner. The pit is filled with rock to grade level. In case of an oil leak or rupture, the oil captured in the containment pit is removed and transported to an approved disposal facility.

Equipment and Systems for Fire

During construction, the risk of fire danger is related to smoking, refueling activities, operating vehicles and other equipment off improved roadways, welding activities, and the use of explosive materials and flammable liquids. Spark arrestors would be used on vehicles and equipment as appropriate. During operation, the risk of fire is primarily from vehicles and maintenance activities that require welding. A Fire Prevention and Suppression Plan will be included in the final POD (refer to Table 2-3) and personnel would receive instructions/training regarding participation in fire suppression operations with local and federal firefighting operations.

All federal, state, and county laws, ordinances, rules, and regulations pertaining to fire prevention and suppression would be strictly adhered to. All personnel would be advised of their responsibilities under the applicable fire laws and regulations.

The prevention and suppression of wildfires in eastern Oregon is carried out by BLM, USFS, and local fire districts and agencies and by BLM, state of Idaho, and local fire districts in Idaho (Table 2-6).

Table 2-6. Fire Suppression Responsibilities in Oregon

Who	Where
Oregon	
City fire departments and rural fire protection districts in mutual aid with Oregon Department of Forestry	Structures in Oregon's wildland interface areas covered by mutual-aid agreements. Rangeland fire protection associations on rangeland areas of eastern Oregon outside of both a forest protection district and a rural fire district.
Bureau of Land Management and Bureau of Reclamation	National System of Public Lands and Bureau of Reclamation managed lands
U.S. Forest Service	National Forest and National Grasslands
Idaho	
City fire departments and Rangeland Fire Protection Associations protection districts in mutual aid with Idaho Department of Lands	Structures in Idaho wildland interface areas covered local fire protection. Rangelands on private lands are protected by Rangeland Fire Protection Association, specifically the Owyhee Rangeland Fire Protection Association.
Bureau of Land Management	National System of Public Lands and Bureau of Reclamation-managed lands
Idaho Department of Lands	State lands

Table Source: ODEQ 2003; Idaho Power Company 2016

Table Note: In Oregon, the agencies' activities are closely coordinated, primarily through the Pacific Northwest Wildfire Coordinating Group. Coordination of firefighting resources also occurs under Oregon's *Emergency Conflagration Act* that allows the state fire marshal to mobilize and dispatch structural firefighting personnel and equipment when a significant number of structures are threatened by fire and local structural fire-suppression capability is exhausted (OSFM 2007).

If the Applicant becomes aware of an emergency situation that is caused by a fire on or threatening BLM-managed or National Forest lands and that could damage the transmission lines or their operation, they would notify the appropriate agency contact. Specific construction-related activities and safety measures would be implemented during construction of the transmission line to prevent fires and to ensure quick response and suppression if a fire occurs. Typical practices to prevent fires during construction and maintenance/repair activities include brush clearing prior to work, posting a fire watch, and stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing "fire behavior" training to all construction personnel, keeping vehicles on or within designated roads or work areas, and providing fire suppression equipment and emergency notification numbers at each construction site.

The Applicant would require its contractor to maintain a list, to be provided to local fire-protection agencies, of all equipment that is either specifically designed for, or capable of, being adapted to fighting fires. The Applicant would require its contractor to provide basic fire-fighting equipment on-site during construction, including fire extinguishers, shovels, axes, and other tools in sufficient numbers so each employee on-site can assist in the event of a fire-fighting operation.

During transmission line operation, the risk of fire danger is minimal. The primary causes of fire on the right-of-way result from unauthorized entry by individuals for recreational purposes and from fires started outside the right-of-way. In the latter case, authorities can use the right-of-way as a potential point of attack for fighting a fire. During transmission line operation, access to the right-of-way would be restricted in accordance with jurisdictional agency or landowner requirements to minimize recreational use of the right-of-way.

During maintenance operations, the Applicant or its contractor would equip personnel with basic fire-fighting equipment, including fire extinguishers, shovels, and polaskis as described above. Maintenance crews also would carry emergency response/fire control phone numbers.

2.3.4 ENVIRONMENTAL DESIGN FEATURES OF THE PROJECT

Early in the project, land-use plans and other documents relevant to the B2H Project were reviewed to identify best management practices and other measures that mitigate potential impacts and were compiled from the multiple sources into a comprehensive list. Sources include BLM resource management plans, the USFS land and resource management plan, agency policy manuals, the interagency operating procedures from the West-wide Energy Corridor EIS (DOE and BLM 2008), and RODs (BLM 2009; USFS 2009), and environmental protection measures proposed by the Applicant. Among the information, there was much redundancy and the list was condensed to be more concise (Draft EIS Appendix C). Comments on the Draft EIS included a criticism that reviewers had difficulty discerning where impacts would occur, how and where impacts would be mitigated, and the relative effectiveness of the measures. In response to those comments, the BLM further refined the measures into two types. One type comprises measures the Applicant would implement as standard practice of construction, operation, and/or maintenance, as applicable. Referred to as design features of the project for environmental protection, these environmental design features are part of the Applicant's project description. Table 2-7 is a list of the environmental design features; and for each feature, the table indicates the phase of the B2H Project the design feature would apply to and the intended effectiveness of the design feature. These environmental design features are applied to all lands, regardless of jurisdiction or ownership, where appropriate. The other type comprises measures that the Applicant has committed to apply to certain areas through the planning process to avoid, reduce, or minimize impacts of the B2H Project. The selective mitigation measures are described in Section 2.5.1.1.

Table 2-7. Design Features of the Project for Environmental Protection				
Design Feature	Application Phase[1]			Effectiveness
	Design and Engineering	Construction	Operation and Maintenance	
1. Plan of Development A Plan of Development (POD) would be prepared for implementation and maintenance of the B2H Project to provide direction to the Applicant's construction personnel, construction contractors and crews, compliance inspection contractor (CIC), environmental monitors, and agency personnel regarding specification of construction; and provide direction to the agencies and Applicant's personnel for operation and maintenance of the B2H Project. The POD would contain implementation plans and detailed mapping to facilitate execution of environmental protection, mitigation measures, and conservation measures. Implementation plans (also refer to EIS Table 2-3) would include the following: • Flagging, Fencing, and Signage Plan • Traffic and Transportation Management Plan • Environmental and Safety Training Plan • Environmental Compliance Management Plan • Biological Resources Conservation Plan • Biological Survey Work Plan • Noxious Weed Management Plan • Water Resources Protection Plan • Historic Properties Management Plan • Paleontological Resources Treatment Plan • Erosion, Dust Control, and Air Quality Plan • Reclamation, Revegetation, and Monitoring Framework Plan • Stormwater Pollution Prevention Plan • Spill Pollution Prevention Containment and Countermeasure Plan • Hazardous Materials Management Plan • Emergency Preparedness and Response Plan • Fire Prevention and Suppression Plan • Blasting Plan	✓	✓	✓	The implementation plans, prepared based on requirements from land-management and/or regulatory agencies, would outline the direction for adhering to the requirements during construction, operation, and maintenance of the B2H Project. The plans would contribute to avoiding, minimizing, rectifying, reducing, eliminating, or compensating for effects of the B2H Project on the environment. The plans would be incorporated into the POD, which would be approved by the agencies prior to commencing construction. Execution of the POD would be a condition of the Record(s) of Decision (ROD) and stipulation for the right-of-way grant and other authorizations.

Table 2-7. Design Features of the Project for Environmental Protection				
Design Feature	Application Phase[1]			Effectiveness
	Design and Engineering	Construction	Operation and Maintenance	
2. Environmental Training for All Personnel Prior to construction, the compliance inspection contractor (CIC) would instruct all personnel on the protection of cultural, paleontological, ecological, and other natural resources such as (a) federal and state laws regarding antiquities, paleontological resources, and plants and wildlife, including collection and removal; (b) the importance of these resources; (c) the purpose and necessity of protecting them; and (d) reporting and procedures for stop work.		✓	✓	This procedure is mandatory to educate all construction and maintenance personnel on the requirements for environmental protection during construction and for maintenance activities set forth in the POD, with the intent of avoiding, minimizing, reducing, or eliminating effects on the environment.
3. Landowner Notification(s) Prior to B2H Project-related activities on private lands, landowners would be contacted for rights-of-entry and to inform them of impending visits to and/or work on their respective properties. A toll-free telephone number would be maintained for landowners to contact the Applicant or the Applicant's designee with questions, concerns, and/or to report any B2H Project-related issues during construction of the B2H Project.	✓	✓		This procedure is intended to keep the private landowners informed of B2H Project-related actions and activities on their lands and would allow for concerns of landowners during construction to be addressed.
4. Preconstruction Surveys for Sensitive Species Preconstruction surveys for special status species, threatened and endangered species, or other species of particular concern would be considered in accordance with the B2H Project Biological Survey Work Plan, which was approved previously by the Applicant and the appropriate land-management or wildlife-management agencies (e.g., Bureau of Land Management [BLM], U.S. Fish and Wildlife Service [USFWS], state wildlife agencies, etc.). In cases for which such species are identified, appropriate action would be taken to avoid jeopardizing the species and its habitat. Amendments to the work plan would be made based on the best available science. Surveys for fish species are not anticipated; Endangered Species Act (ESA)-listed fish species would be presumed present in all watersheds that agency data indicate presence.	✓	✓		While the surveys or the results of the surveys are not measures that avoid, reduce, minimize, or eliminate over time effects on the special status species, the results of the surveys would be used to generate professional recommendations for mitigation and/or conservation measures to protect the species. The resulting mitigation and/or conservation measures would be incorporated into the POD.
5. Spatial Extent of Construction Activities The spatial limits of construction activities, including vehicle movement, would be predetermined with activity restricted to and confined within those limits. No paint or		✓		Restricting all construction activities and vehicle movement to the areas granted for right-of-way, easement, special-use authorization would avoid

Table 2-7. Design Features of the Project for Environmental Protection				
Design Feature	Application Phase[1] Design and Engineering	Construction	Operation and Maintenance	Effectiveness
permanent discoloring agents indicating survey or construction limits would be applied to rocks, vegetation, structures, fences, etc.				disturbance outside the area granted. Also, this design features precludes use of permanent discoloring agents inside or outside the area granted for the B2H Project.
6. Reclaim Construction Areas In construction areas (e.g., staging areas, material laydown yards, fly yards, and wire pulling/splicing sites), where there is ground disturbance and where recontouring is required, surface reclamation would occur as required by the Reclamation, Revegetation, and Monitoring Plan or the landowner. The method of reclamation may consist of, but not be limited to, returning disturbed areas to their natural contour, replacement of displaced rocks and boulders in a manner that does not create strong edge conditions, reseeding, installing cross drains for erosion control, placing water bars in permanent roads, use of vertical pitting and mulching used for clearings in sage areas, and filling ditches where they were installed for temporary roads. All areas disturbed as a part of the construction and/or maintenance of the proposed transmission line would be seeded with a seed mixture appropriate for those areas as identified in the Reclamation, Revegetation, and Monitoring Plan. The federal land-management agency or landowner(s) would approve a seed mixture that is compatible with the affected Ecological Site Description. Seeding methods typically would include drill seeding, where practicable; however, the federal land-management agency or landowner(s) may recommend broadcast seeding as an alternative method in some cases. In construction areas where disturbing the existing contours is not required, vegetation would be left in place wherever possible, and original contours would be maintained to avoid excessive root damage and allow for resprouting in accordance with the Reclamation, Revegetation, and Monitoring Plan or landowner approval.		✓	✓	Reclaiming areas disturbed following construction by rectifying the effects of construction by repairing, rehabilitating, or restoring the affected environment to a visually similar character by replicating colors, patterns and textures to those found prior to the project induced disturbances. Placement of rocks and boulders to avoid creating additional strong linear edges helps to restore similar visually character of the disturbed areas.

Table 2-7. Design Features of the Project for Environmental Protection

Design Feature	Application Phase[1] Design and Engineering	Construction	Operation and Maintenance	Effectiveness
7. Salvage Topsoil for Revegetation In work areas where ground-disturbing activities would occur, topsoil would be salvaged and segregated prior to construction, to be redistributed and contoured evenly over the surface of the disturbed area to be removed following completion of construction. The soil surface would be seeded with an agency- or landowner-approved seed mix and left rough to help reduce the potential for erosion and loss of seeded surface as specified in the reclamation plan.		✓	✓	The intent of this procedure is to facilitate reclamation, revegetation and restoration by using the stockpiled native topsoil, and leave the surface in a condition to reduce potential for erosion and better assist revegetation establishment to reduce or eliminate the effects over time.
8. Overland Travel in Construction Work Areas Grading would be minimized by driving overland in areas approved in advance by the land-management agency and/or land owner in predesignated work areas (e.g., staging areas, material laydown yards, fly yards, and wire pulling/splicing sites) whenever possible.	✓	✓	✓	This practice would reduce and/or minimize potential for additional erosion and introduction of noxious weeds; and increase revegetation success by leaving existing vegetation roots intact by reducing the amount of grading during construction.
9. Use of Access Routes Outside of Right-of-way All vehicle movement outside the right-of-way would be restricted to predesignated access, contractor-acquired access, public roads, overland travel routes, or crossings of streams approved in advance by the applicable land-management agency or landowner.		✓	✓	Similar to Design Feature 4, restricting vehicle movement would preclude disturbance outside areas essential for B2H Project-related travel to avoid B2H Project effects outside of the right-of-way.
10. Speed Limit on Project Access Routes To minimize vehicle collisions with wildlife or livestock and reduce amount of dust generated from construction related activities, a speed limit of 25 miles per hour would be employed on B2H Project access routes, unless the applicable land-management agency has designated an alternative speed limit.		✓	✓	Slower vehicular-travel speeds allow for increased time for driver response, thereby minimizing the potential for such collisions. Also, vehicles traveling at slower speeds generate less dust, reducing B2H Project effects.
11. Limit Construction and Maintenance Activities During Migratory Bird Nesting Season If ground-disturbing activities (e.g., vegetation clearing or construction activities) could not be avoided during the migratory bird nesting season (between April 1 and July 15), migratory bird and nest surveys would be required within 7 days of any ground-disturbing activities. A spatial buffer would be placed around each active nest detected during the surveys in the area where the buffer intersects work areas where		✓	✓	Limiting construction and maintenance activities during migratory bird nesting season would minimize and avoid disturbance and/or the take of migratory birds and their nests during construction and maintenance activities by conducting these operations outside the migratory bird nesting season and away from active nests.

Table 2-7. Design Features of the Project for Environmental Protection

Design Feature	Application Phase[1] Design and Engineering	Construction	Operation and Maintenance	Effectiveness
vegetation clearing or construction is taking place, until such time as the nest is determined, through monitoring, to be no longer occupied. Appropriate spatial nest buffers (by species or guild) and nest-monitoring requirements would be identified using the best available scientific information through coordination with USFWS and other appropriate agencies, and would be provided in a migratory-bird nest-management plan incorporated into the POD.				
12. Avian-Safe Design The Applicant would design and construct all new or rebuilt transmission facilities to avian-safe design standards, including the Applicant's Avian Protection Plan (Idaho Power 2015), Reducing Avian Collisions with Power Lines (APLIC 2012) and Suggested Practices for Avian Protection on Power Lines (APLIC 2006).	✓	✓		This would reduce and/or eliminate the potential for raptor or other large-bird electrocutions and minimize the potential for raptor and other bird collisions with the transmission line through the implementation of these standards.
13. Raptor Protection During Breeding Agency guidelines for raptor protection during the breeding season would be followed.	✓	✓	✓	Following these guidelines would avoid take of raptors and minimize disturbance by implementing seasonal and spatial restrictions around active raptor nests during construction and maintenance activities.
14. Shallow Groundwater Discovery During Drilling State standards for abandoning drill holes would be adhered to where groundwater is encountered.		✓		Complying with state standards for abandoning drill holes where groundwater is encountered would address the potential for contamination of groundwater in the event they are encountered during geotechnical investigation and/or construction.
15. Reduce Impacts on Riparian Areas Consistent with the BLM and USFS riparian management policies, surface-disturbing activities would be avoided in defined segments of Riparian Conservation Areas[2], using the following delineation criteria, unless exception criteria defined by the BLM are met or with agency approval of acceptable measures to protect riparian resources and habitats by avoiding or minimizing stormwater runoff, sedimentation, and disturbance of riparian vegetation, habitats, and wildlife species: • Fish-bearing streams: 300 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest.	✓	✓	✓	This would reduce potential for direct and indirect impacts on riparian areas and the vegetation, fish, and wildlife habitats associated with them by avoiding, minimizing, reducing, and/or eliminating over time modification of these areas through development of site-specific mitigations.

Table 2-7. Design Features of the Project for Environmental Protection				
Design Feature	Application Phase[1]			Effectiveness
	Design and Engineering	Construction	Operation and Maintenance	
• Perennial non-fish bearing streams: 150 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest. • Ponds, lakes, reservoirs, and wetlands greater than 1 acre: 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs, or from the edge of the wetland, pond or lake, or to the extent of additional delineation criteria, whichever is greatest. • Intermittent or seasonally flowing streams and wetlands less than 1 acre in watersheds that support ESA-listed fish species and /or designated critical habitat: 100 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest. • Intermittent or seasonally flowing streams and wetlands less than 1 acre in watersheds that do not have current, documented presence of ESA-listed fish species and /or designated critical habitat: 50 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest. Mitigation measures, such as micro-siting road locations, would be developed on a site-specific basis, in consultation and coordination with the BLM and other federal land-management agencies, and incorporated into the final POD.				
16. Span Riparian Communities/Water Courses Based on biological resources surveys and results of Section 7 consultation (with USFWS and National Oceanic and Atmospheric Administration [NOAA] Fisheries), state and federally designated sensitive plants, fisheries, habitat, wetlands, riparian areas, springs, wells, water courses, or rare/slow regenerating vegetation communities would be flagged and structures would be placed to allow spanning of these features, where feasible, within the limits of standard structure design. Surveys for fish species are not anticipated; ESA-listed fish species would be presumed present in all watersheds that agency data indicate presence.	✓			Spanning riparian communities and/or water courses would avoid, minimize and/or reduce potential for impacts on riparian areas and water courses by siting project facilities outside of these areas.

Table 2-7. Design Features of the Project for Environmental Protection

Design Feature	Application Phase[1]			Effectiveness
	Design and Engineering	Construction	Operation and Maintenance	
17. Work During Wet Periods If work were required during wet periods with saturated soil conditions, vehicles would not be allowed to travel when soils are moist enough for deep rutting (4 or more inches deep) to occur unless prefabricated equipment pads (matting) were installed over the saturated areas or other measures were implemented to prevent rutting. Equipment with low-ground-pressure tires, wide tracks, or balloon tires would be used when possible.		✓	✓	This would avoid, minimize, and/or reduce potential for impacts on riparian and soil resources by avoiding work in these areas during wet periods and/or by taking measures that would reduce and minimize disturbance of these areas if work in them could not be avoided during wet periods.
18. Crossing of Dry Washes Crossings of dry washes would be made during dry conditions, when possible. Repeated crossings would be limited to the extent possible but constrained to the same location with appropriate stabilization to reduce erosion potential.		✓	✓	This would avoid and minimize potential for impacts on water quality and stream structure and function by limiting crossing periods and the frequency of the crossings.
19. Canal and/or Ditch Crossings Canal and/or ditch crossings would require placement of temporary bridges or improvement of existing crossings.	✓	✓		This is intended to avoid or minimize damage to water-delivery infrastructure and/or interference with delivery of water.
20. Reduce Potential for Aquatic Invasive Species Interagency-developed methods of avoidance, inspection, and sanitization as described in the Operational Guidelines for Aquatic Invasive Species Prevention and Equipment Cleaning (USFS 2009) would be adhered to. If control of fugitive dust near sensitive water bodies is necessary, water would be obtained from treated municipal sources or drafted from sources known to contain no aquatic invasive species. Support vehicles, drill rigs, water trucks and drafting equipment would be inspected and sanitized, as necessary, following interagency-approved operational guidelines.		✓	✓	This would avoid, reduce, and/or minimize the potential for spread of aquatic invasive species through adherence with methods to prevent the transport of these invasive species during construction activities associated with the B2H Project.
21. Disposal of Hazardous Materials and Construction Waste Hazardous material would not be discharged onto the ground or into streams or drainage areas. Enclosed containment would be provided for all waste. All construction waste (i.e., 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 within 1 month of B2H Project completion, except for hazardous waste which would be removed within 1 week of B2H Project		✓	✓	Proper disposal of hazardous materials and construction waste is intended to avoid introduction of such waste into the environment. As explained in Design Feature 1, a Spill Pollution Prevention and Countermeasure Plan would be completed and be a part of the POD.

Table 2-7. Design Features of the Project for Environmental Protection				
Design Feature	Application Phase[1]			Effectiveness
	Design and Engineering	Construction	Operation and Maintenance	
completion. Refueling and storing potentially hazardous materials would not occur within a 200-foot radius of all identified private water wells, and a 400-foot radius of all identified municipal or community water wells. Spill prevention and containment measures would be incorporated as needed.				
22. Right-of-way Debris All nonbiodegradable debris from the construction or maintenance of the transmission line would be collected and removed from the right-of-way when the construction or maintenance is complete. Slash would be left in place or disposed of in accordance with requirements of the land-management agency or landowner.		✓	✓	Proper disposal of right-of-way debris is intended to avoid introduction of debris into the environment and minimize the effects of construction. However, slash may be left in place if the land-management agency or landowner identify a benefit (e.g., erosion control, habitat).
23. Open Burning of Trash Open burning of construction trash would not be allowed unless permitted by the appropriate authorities.		✓	✓	Disallowing open burning of trash avoids that as the potential for ignition of inadvertent, accidental wildfire.
24. Spark Arrestor on Combustion Engines All internal- and external-combustion engines would be operated per 36 Code of Federal Regulations 261.52, which requires all such engines to be equipped with a qualified spark arrester that is maintained and not modified.		✓	✓	Requiring spark arrestors on all internal- and external-combustion engines would minimize the potential for such sparks as cause ignition of inadvertent, accidental wildfire.
25. Avoid Work in Hazardous/Contaminated Sites Where work would occur on hazardous and contaminated sites, the Applicant must seek approval from the U.S. Environmental Protection Agency (EPA) as required by federal law. Work on contaminated sites must avoid remedial structures (e.g., capped areas, treatment, or monitoring wells, etc.) and workers must use adequate worker protection measures for working in contaminated areas.		✓	✓	Avoiding work in sites recognized by the EPA as hazardous and/or contaminated precludes issues of construction worker health and safety and reduces potential damage to remedial structures.
26. Reduce Corona Corona is the localized electric field near a conductor that can be sufficiently concentrated to ionize air close to the conductors, and can result in a partial discharge of electrical energy (corona discharge or corona). Corona from conductors and hardware may cause audible noise and radio noise (which may interfere with	✓	✓	✓	Implementing design and engineering features and construction techniques to reduce corona would reduce audible noise, radio and television interference, and power losses that result in operating inefficiencies.

Table 2-7. Design Features of the Project for Environmental Protection				
Design Feature	Application Phase[1]			Effectiveness
	Design and Engineering	Construction	Operation and Maintenance	
communications). Transmission line materials that have been designed and tested to minimize corona would be used. A bundle configuration and larger conductors would be used to limit audible noise, radio interference, and television interference due to corona. Tension would be maintained on all insulator assemblies to ensure positive contact between insulators, thereby avoiding sparking. Caution would be exercised during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.				
27. Respond to Complaints of Radio or Television Interference The Applicant would respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigating measures where appropriate and possible. In addition, the transmission lines would be patrolled by air or inspected on the ground on a periodic basis, in compliance with the Applicant's standards, so damaged insulators or other line materials that could cause interference are repaired or replaced.			✓	As implied, the Applicant would maintain the transmission line to avoid or minimize line-generated radio and television interference.
28. Avoid Induced Currents and Voltages The Applicant would apply grounding or other methods where possible to minimize or eliminate problems of induced currents and voltages onto conductive objects sharing the same right-of-way, to meet the appropriate codes.		✓	✓	As stated, applying grounding or other methods, where possible, would avoid or minimize problems of induced current and voltages on conductive objects.
29. Use of High-visibility Markers for Air Traffic Safety Towers and/or shield wires would be marked with high-visibility devices (i.e., marker balls or other marking devices) where required by governmental agencies with jurisdiction (i.e., Federal Aviation Administration). An offset catenary on separate poles would be used in lieu of marking the conductor. Tower heights would be less than 200 feet to avoid the need for aircraft obstruction lighting.	✓			Use of high-visibility markers is intended to avoid potential for air-traffic collision with the transmission line.

Table 2-7. Design Features of the Project for Environmental Protection

Design Feature	Application Phase[1]			Effectiveness
	Design and Engineering	Construction	Operation and Maintenance	
30. Reduce Visual Impacts Dull-galvanized steel for lattice towers and non-specular conductors would be used to reduce visual impacts.	✓	✓		The use of these materials is effective in minimizing the visual contrast introduced by the structures, conductors, and insulators. This reduced contrast also allows for greater visual absorption of the B2H Project into the surrounding landscape.
31. Compliance with National Historic Preservation Act In accordance with the Programmatic Agreement (to comply with Section 106 of the National Historic Preservation Act) entered into among the BLM; USFS; the states of Idaho and Oregon; consulting parties; and tribes, specific measures to mitigate effects on cultural resources would be developed and implemented to mitigate identified adverse impacts.	✓	✓		As implied, the intent is to develop site-specific measures to mitigate effects on cultural resources. These may include B2H Project modifications (e.g., selective placement of structures, span sites) to avoid adverse impacts, cultural resources monitoring of construction activities to avoid or minimize damage to discoveries, and data recovery studies to minimize loss of data important to the historical record.
32. Maintain Existing Watering Facilities Watering facilities (tanks, natural springs and/or developed springs, water lines, wells, etc.) would be repaired or replaced if they are damaged or destroyed by construction and/or maintenance activities to their predisturbed condition as required by the landowner or land-management agency. Should construction and/or maintenance activities prevent use of a watering facility while livestock are grazing in that area, then the Applicant would provide alternate sources of water and/or alternate sources of forage where water is available.		✓	✓	This would rectify the impact on stock-watering facilities by repairing or replacing such facilities if they are damaged or destroyed or an alternate water source is needed.
33. Maintain Function of Livestock Containment Facilities Fences, gates, and walls would be replaced, repaired, or reclaimed to their original condition as required by the landowner or the land-management agency in the event they are removed, damaged, or destroyed by construction activities. Fences would be braced before cutting. Temporary gates or enclosures would be installed only with the permission of the landowner or the land-management agency and would be removed/reclaimed following construction unless approved by the land management agency or landowner to be left after construction is complete. Cattle guards or permanent access gates would be installed where new permanent access roads cut		✓	✓	These procedures are intended to avoid, minimize, rectify or eliminate impacts that could occur on livestock grazing operations and/or range improvements by taking pre-cautions to maintain the function of the fences, gates, and walls.

Table 2-7. Design Features of the Project for Environmental Protection				
	Application Phase[1]			
Design Feature	Design and Engineering	Construction	Operation and Maintenance	Effectiveness
through fences on land administered by an affected federal agency or other grazing lands. Temporary gates across breached fences may be required when livestock are actively grazing an area in which the breached fence is located when construction activities have halted for a time. This temporary gate would prevent livestock on one side of the fence from going to the other side through the breach. Should construction activities prevent use of a facility, such as a corral when that corral is needed to facilitate movement of livestock, then the Applicant would provide a temporary corral to facilitate movement of livestock.				
34. Avoid Calving, Lambing, and Trailing Areas Calving, lambing, and trailing areas would be avoided when in use by livestock operations to the extent practicable. Trailing areas (areas where livestock producers move livestock across lands to facilitate proper grazing management) can occur throughout the B2H Project area and timing may vary throughout the year. Prior to construction, the Applicant would coordinate with the applicable land-management agency or private landowner to determine when grazing occurs and avoid areas used for calving, lambing, and trailing during construction.		✓	✓	These procedures are intended to avoid, minimize or eliminate impacts that could occur on livestock operations by taking precautions to avoid interruptions to calving, lambing and trailing areas when in use.
35. Avoid Agricultural Operations On agricultural land, the right-of-way would be aligned, insofar as is practicable, to reduce the impact on farm operations and agricultural production.	✓			Avoidance of agricultural operations through the design and engineering of the B2H Project is intended to preclude interference with agricultural operations.

Table 2-7. Design Features of the Project for Environmental Protection

Design Feature	Application Phase[1] Design and Engineering	Construction	Operation and Maintenance	Effectiveness
36. Minimize/Reduce Interference with Agricultural Operations Construction and maintenance activities would occur as practicable to minimize impacts on agricultural operations. In cultivated agricultural areas, soil compacted by construction and maintenance activities would be decompacted or the landowner compensated accordingly.		✓	✓	Where construction and maintenance activities occur on agricultural lands, this measure is intended to minimize the impact of these activities through the timing and coordination of them with the agriculture operations.
37. Patrol and Maintain the Project The transmission line and rights-of-way would be patrolled regularly and properly maintained in compliance with applicable safety codes.			✓	Regular patrol of the transmission line and rights-of-way results in recommendations for corrective maintenance, including maintenance of vegetation, access roads, as well as the transmission line.

Table Notes:

[1]Design features of the B2H Project for environmental protection are measures or procedures that are part of the B2H Project description and implemented as standard practice and include measures or procedures that could avoid, minimize, reduce, or rectify (or eliminate over time) adverse impacts. These three columns refer to the phase and/or phases of the B2H Project during which design features are relevant (i.e., during design and engineering, construction, and/or operation and maintenance).

[2]Distances represent default Riparian Conservation Area widths recommended in PACFISH, and are consistent with PACFISH (USFS and BLM 1995) and INFISH (USFS 1995) strategies, and the Updated Interior Columbia Basin Strategy – Memorandum #1920 (BLM, USFS, USFWS, EPA, and NOAA Fisheries 2014).

2.3.4.1 Decommissioning

Typically, transmission lines that have been regularly maintained continue to provide service longer than the projected service life of at least 50 years. At the end of the service life of the B2H Project, assuming that it is not upgraded or otherwise kept in service, the transmission line, service roads, and other associated facilities would be decommissioned. At such time, a plan for dismantling and removing conductors, insulators, and hardware from the right-of-way would be developed and approved by the permitting agencies, and additional NEPA analysis would be completed, if necessary. Tower and pole structures would be removed and foundations demolished to a point below the ground surface and buried. All long-term disturbances on federal land would be restored in accordance with a Termination and Reclamation Plan approved by the federal land-management-agency Authorized Officer, as appropriate. Since it is not possible to know which facilities would be needed and would remain and/or facilities that would be removed, and it is difficult to predict the status of land use and policy regarding decommissioning and reclamation at a point that far in the future, the effects of decommissioning of the B2H Project are not analyzed in this EIS. Requirements for decommissioning and reclamation (including environmental protection) would have to be addressed in a comprehensive Termination and Reclamation Plan (or equivalent) when decommissioning is proposed. Such a plan would need to be filed 2 years before the termination of the right-of-way and approved by the permitting agencies.

A decommissioning bond also will be required 2 years prior to the expiration of the right-of-way grant (i.e., 30 years with the right of renewal) and USFS special-use authorization in the event the holder fails for whatever reason to comply with the terms, conditions, and special stipulations of the grant or to renew the right-of-way grant(s) (and USFS special-use authorization) at the end of the appropriate terms. The decommissioning bond amount is to be determined with a Reclamation Cost Estimate (RCE) Report submitted for the Applicant by an independent state-certified engineer, approved by the agencies and containing engineer’s seal, and the final amount approved by the BLM and USFS, in an amount sufficient to include all expenses related to the decommissioning, removal, and restoration of the right-of-way grant(s) and USFS special-use authorization on BLM- and USFS-administered land, respectively. All costs of preparing and submitting this report shall be borne by the holder. If the right-of-way grant and special use authorizations are renewed by the BLM or USFS, the bond will be terminated. If the grant is not renewed, the BLM will hold the bond until reclamation acceptable to the BLM Authorized Officer and USFS Deciding Official is completed.

2.4 Alternatives Development

The NEPA requires federal agencies to “…study, develop, and describe appropriate alternatives to recommend courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources” (NEPA Section 102(2)(E)). The Council on Environmental Quality Forty Most Asked Questions Concerning CEQ’s NEPA Regulations provide that “reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant" (CEQ 1981: Question 2a).

The Applicant's process to identify the initial, preliminary alternative routes and, ultimately, an Applicant's Proposed Action Alternative route, or proposed corridor, for the proposed transmission line is summarized in the 2010 Siting Study (Idaho Power Company 2010) and 2012 Supplemental Siting Study (Idaho Power Company 2012) (available at http://www.boardmantohemingway.com/aspx). BLM considered, in part, the Applicants' Proposed Action Alternative along with the BLM's purpose and need in developing alternatives to be analyzed in the EIS. Between the Draft EIS and Final EIS, revisions were made to the network of alternative routes in response to comments on the Draft EIS as described in Section 2.1.1.

2.5 Study and Analysis Methods

Comments on the Draft EIS suggested the need to describe further the approach used for studying, analyzing, and comparing the alternative routes to clarify information presented and support conclusions. In response, the following section has been added to the EIS to summarize the overall approach used for studying, analyzing, and comparing the alternative routes developed.

2.5.1 Studying and Analyzing the Alternatives

The following text summarizes the approach used for studying, analyzing, and comparing the alternative routes developed in response to the need for the B2H Project and the need for the affected federal agencies to respond to the Applicant's application for right-of-way on federal land. Consistent with Section 102(2)(A) of NEPA, the process described uses "a systematic interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making, which may have an impact on man's environment" (as specified in 40 CFR 1507.2). Tiered from the overall approach, methodologies adapted for each resource study are presented in the introductory information in resource section in Chapter 3.

This section includes a description of baseline data collection and the method for assessing impacts and applying measures to avoid, reduce, minimize, or eliminate those impacts (Section 2.5.1.1) and the method for comparing the alternative routes (Section 2.5.1.1) from which a route exhibiting the least impact emerges. The process is summarized in Figure 2-19. In concert with environmental results, administrative, management, and current land-use factors are considered by the participating agencies to derive the Agency Preferred Alternative (Section 2.7). System planning and reliability, engineering, costs, safety, schedule, and constructability are among the factors the Applicant considers to identify its Applicant's Proposed Action Alternative (Section 2.8).

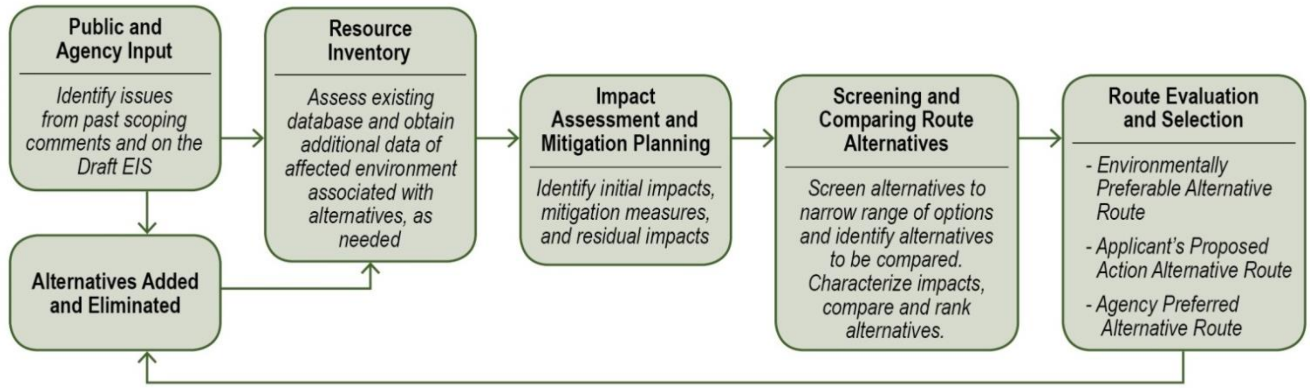


Figure 2-19. Boardman to Hemingway Transmission Line Project Environmental Study Approach

2.5.1.1 Studying and Analyzing Alternatives

Relevant law and policy and the issues identified through the scoping process guide what studies of the natural, human, and cultural environments federal agencies must conduct and address in an interdisciplinary manner in the EIS. The studies for B2H Project were designed to develop an inventory of environmental data reflecting the existing condition of the environment in sufficient detail to:

- Predict potential or probable impacts on the environment brought about by the construction, operation, and maintenance of the proposed transmission line, access roads, and ancillary facilities along each of the alternative transmission line routes;
- Prepare realistic recommendations to avoid, minimize, rectify, reduce, or eliminate impacts identified during the analysis;
- Compare the alternative routes based on interdisciplinary resource analysis and identify the alternative route exhibiting the least impact;
- Identify an Agency Preferred Alternative in response to local concerns and in collaboration with the cooperating agencies; and
- Meet the environmental reporting requirements of the BLM, in coordination with cooperating federal and state agencies and county and local governments.

Resource Inventory

Data on the existing condition of each resource were gathered and compiled, using the most recent data available—primarily literature, published and unpublished reports, land-use plans, maps, and agency databases. Data gathered for visual resources were verified by field reconnaissance. Comments on the Draft EIS informed the BLM of new and/or updated data, which were gathered and compiled for use in preparing the Final EIS. During an agency workshop conducted in August 2015, the BLM requested the agency interdisciplinary team and cooperating agencies to review the updated data for adequacy and provide information regarding additional issues, concerns, policies, and regulations.

For most of the resources, inventories for the EIS were developed to describe the existing environment in the study corridors along the alternative routes in sufficient detail to assess potential direct and indirect impacts that could result from the proposed B2H Project. The width of the study corridor varies for some resources based on the area that potentially could be affected (Table 2-8). Analysis of air quality is based on regional data. Data used to assess potential impacts on social and economic conditions are countywide and statewide and are not extracted for study-corridor-level analysis. Resource inventories informed development of the Affected Environment section documented in Chapter 3.

Table 2-8. Study Corridors by Resource

Resource	Study-Corridor Width (miles)
Earth resources	1
Paleontological resources	1
Water resources	1
Biological resources (vegetation, special status plants, wildlife, special status wildlife, migratory birds, fish and aquatics)	1
Land use	1
Agriculture	1
Recreation	1
Transportation	1
Potential congressional designations	1
Lands with wilderness characteristics	1
Visual resources	10
National trails system	10
Cultural resources	4

Table Note: Analysis of air quality is based on regional data. Data and information used to assess potential social and economic impacts are based on countywide and statewide data and are not extracted for corridor-level assessment.

The alternative routes (and study corridors) are centered on a line referred to as the reference centerline. The reference centerlines were mapped in detail sufficient for analysis for the EIS. Precise locations of the centerline would be refined through engineering surveys on the route selected for the transmission line prior to construction of the B2H Project. Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links are numbered generally from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with alternative routes in an adjacent segment; the common endpoint is referred to as a segment node.

To facilitate analysis and reference, mileposts are marked along the reference centerline of each link. Resource data collected for the area in a study corridor are input, stored, and retrieved by link number and milepost (to 0.1 mile). Where appropriate, resource discussions in this document (principally Chapter 3) refer to links and mileposts to provide a geographic reference to the resource data. Maps displaying resource inventory data and impacts are in Volume II – Maps. The results of the inventory of resources are documented by link and milepost in resource inventory summaries and maps.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Impacts on the environment can result directly (caused by the action and occurs at the same time and place) or indirectly (caused by the action and is later in time or farther removed in distance, but still reasonably foreseeable) and can be temporary (short-term), long-term, or permanent. The assumptions for each resource define temporal scope of analysis. In this analysis, temporary environmental effects predicted to occur during construction of the B2H Project that would be anticipated to return to a preconstruction condition at or within 5 years of the end of construction were considered short-term impacts. Environmental effects anticipated to be remaining after 5 years are considered long-term impacts. Permanent impacts are those that would be anticipated to endure beyond the life of the B2H Project, including irreversible and irretrievable commitment of resources. Impacts can be beneficial (positive) or adverse (negative) and can vary in significance from no change or only slightly discernible change to a full modification of the environment. Cumulative impacts result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions (RFFA) and can result from individually minor but collectively significant actions taking place over a period of time. The approach used to address cumulative effects is described in Section 3.3.

Once the environmental inventory (baseline resource data) was compiled for each alternative route and the data were reviewed by the lead and cooperating agencies, potential effects of the proposed B2H Project were assessed and measures were recommended, where appropriate, to avoid, minimize, rectify, reduce, or eliminate the impacts (refer to subsection Mitigation Planning and Effectiveness below). The process of assessing impacts and applying measures to reduce impacts is a systematic interdisciplinary analysis that first identifies initial impacts based on a comparison of the proposed B2H Project (i.e., the predicted types and amounts of disturbance) and the existing condition of the environment (before the B2H Project). Then, measures may be applied selectively on a case-by-case basis and often in localized areas to effectively reduce impacts further, thereby resulting in residual impacts or the impacts remaining after the application of the selective measures. Figure 2-20 provides an overview of the impact assessment and mitigation planning process. Results of impact assessment and mitigation planning are presented in the Environmental Consequences sections in Chapter 3.

ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING

The first step of the analysis was to determine the types and amount of ground disturbance that could occur based on the design and typical specifications of the proposed facilities, construction techniques (including design features of the project for environmental protection [Table 2-7]) and equipment used, extent and duration of the construction, requirements for operation of the transmission line and associated facilities, and activities associated with routine maintenance.

Most of the potential physical impacts that could occur, including ground disturbance, would result from the following construction activities:

- Upgrading existing roads or constructing new roads for access where needed
- Preparing structure sites, multi-use areas, and communication station sites
- Assembling and erecting tower structures
- Stringing conductors (e.g., wire pulling-and-tensioning sites and wire-splicing sites)

In addition, impacts on some resources would occur following construction from the presence of the transmission lines and access roads. Also, periodic maintenance activities could cause temporary impacts.

Since the B2H Project facilities have not been fully designed and locations of the transmission line facilities are not known, for the purpose of estimating impacts, the amount of ground that could be disturbed as a result of implementation of the B2H Project was estimated based on the typical design characteristics of the 500-kV transmission line and ancillary facilities (Section 2.3.1), including tower sites, multi-purpose construction yards, communication regeneration station sites, etc., as well as the 230-kV line and 138/69-kV line segments potentially planned for relocation. The estimated ground disturbance associated with using existing access roads or upgrading or constructing access roads also was considered. Temporary ground disturbance during construction would be associated with structure work areas, wire-splicing sites, wire pulling-and-tensioning sites, multi-purpose construction yards, and temporary access roads. Permanent ground disturbance would be associated with structure foundation areas, communication station sites, and permanent access roads. Estimated ground disturbance from access road per mile of transmission line is presented in Table 2-9. Estimated ground disturbance associated with the 500-kV transmission line is presented in Table 2-10. Estimated ground disturbance associated with the 230-kV and 138/69-kV line segments to be relocated is presented in Table 2-11, and disturbance associated with the 230-kV double-circuit line (additional action for replacing the BPA's 69-kV line is presented in Table 2-12).

Table 2-9. Access Levels and Potential Ground Disturbance

Project Access Level		Estimated Disturbance per Mile of Transmission Line
1	Use existing road (0 to 15 percent slopes) within half the distance of the typical span from project centerline; no improvements required; spur roads	2.8 acres
2	Use existing road (greater than 15 percent slopes) within half the distance of the typical span from project centerline; improvements required; spur roads	6.7 acres
3	Construct new access road (0 to 8 percent slopes)	3.5 acres
4	Construct new access road (8 to 15 percent slopes)	5.3 acres
5	Construct new access road (15 to 30 percent slopes)	8.5 acres
6	Construct new all-terrain vehicle access road (greater than 30 percent slopes)	14.2 acres

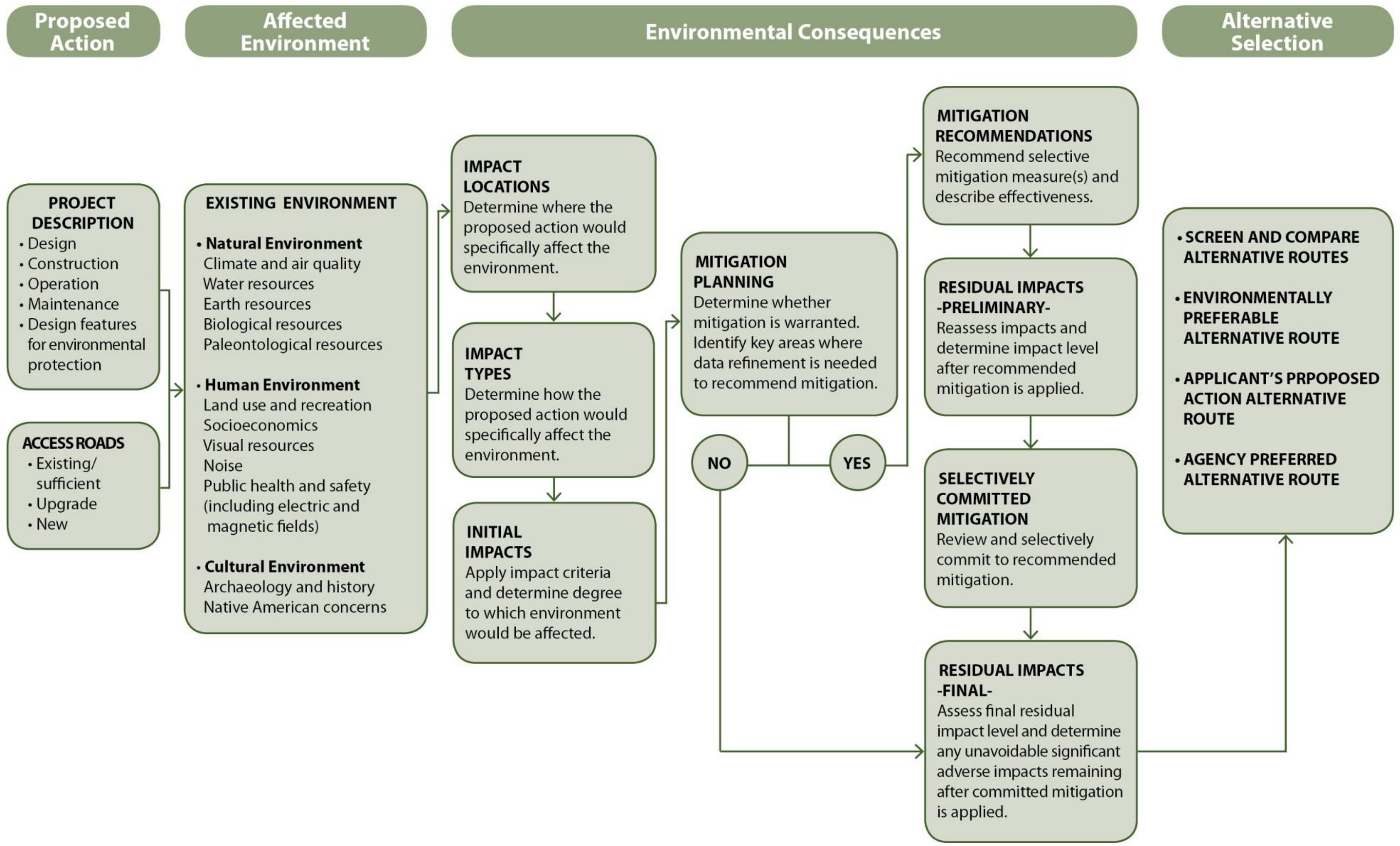


Figure 2-20. Impact Assessment and Mitigation Planning Process

Table 2-10. Summary of Estimated Ground Disturbance and Vegetation Clearing for the 500-Kilovolt Transmission Line Alternative Routes by Segment

Alternative	Temporary Disturbance (acres)[1,5]	Permanent Disturbance (acres)[2,5]	Total Disturbance (acres)[3,5]	Transmission Line Right-of-way Vegetation Clearing (acres)[4,5]
Segment 1 - Morrow-Umatilla				
Applicant's Proposed Action	1,395	512	1,907	442
Variation S1-B1	*92*	*50*	*142*	*181*
Variation S1-B2	*92*	*44*	*136*	*162*
East of Bombing Range Road	1,402	512	1,913	442
Applicant's Proposed Action – Southern Route	1,512	578	2,090	484
West of Bombing Range Road – Southern Route	1,455	656	2,111	484
Longhorn	1,361	507	1,867	442
Interstate 84	1,307	478	1,784	442
Variation S1-A1	*285*	*75*	*360*	*0*
Variation S1-A2	*285*	*122*	*408*	*0*
Interstate 84 – Southern Route	1,441	548	1,989	484
Segment 2 - Blue Mountain				
Applicant's Proposed Action	522	243	764	363
Variation S2-A1	*43*	*15*	*58*	*45*
Variation S2-A2	*45*	*16*	*60*	*48*
Variation S2-B1	*57*	*28*	*85*	*41*
Variation S2-B2	*59*	*26*	*85*	*45*
Variation S2-C1	*143*	*78*	*221*	*188*
Variation S2-C2	*136*	*55*	*191*	*172*
Variation S2-E1	*35*	*17*	*52*	*38*
Variation S2-E2	*40*	*18*	*58*	*38*
Variation S2-F1	*187*	*73*	*260*	*10*
Variation S2-F2	*188*	*78*	*266*	*6*
Glass Hill	520	232	752	331
Variation S2-D1	*66*	*42*	*109*	*102*
Variation S2-D2	*63*	*35*	*98*	*76*
Mill Creek	525	259	784	274
Segment 3 - Baker Valley				
Applicant's Proposed Action	852	386	1,238	0
Variation S3-A1	*191*	*68*	*259*	*0*
Variation S3-A2	*188*	*63*	*252*	*0*
Variation S3-B1	*214*	*97*	*311*	*0*
Variation S3-B2	*222*	*92*	*315*	*10*
Variation S3-B3	*227*	*85*	*312*	*10*
Variation S3-B4	*221*	*79*	*300*	*10*
Variation S3-B5	*216*	*85*	*301*	*10*

Table 2-10. Summary of Estimated Ground Disturbance and Vegetation Clearing for the 500-Kilovolt Transmission Line Alternative Routes by Segment

Alternative	Temporary Disturbance (acres)[1,5]	Permanent Disturbance (acres)[2,5]	Total Disturbance (acres)[3,5]	Transmission Line Right-of-way Vegetation Clearing (acres)[4,5]
Variation S3-C1	*326*	*177*	*502*	*0*
Variation S3-C2	*335*	*177*	*512*	*0*
Variation S3-C3	*326*	*189*	*515*	*22*
Variation S3-C4	*330*	*193*	*524*	*22*
Variation S3-C5	*324*	*252*	*576*	*41*
Variation S3-C6	*381*	*304*	*685*	*92*
Flagstaff A	853	375	1,228	10
Timber Canyon Alternative	1,085	606	1,691	655
Flagstaff A – Burnt River Mountain	853	387	1,241	32
Flagstaff B	864	375	1,239	10
Flagstaff B – Burnt River West	859	445	1,305	51
Flagstaff B – Durkee	920	502	1,422	102
Segment 4 - Brogan				
Applicant's Proposed Action	619	335	953	0
Variation S4-A1	*91*	*63*	*154*	*0*
Variation S4-A2	*93*	*57*	*149*	*0*
Variation S4-A3	*94*	*58*	*153*	*0*
Tub Mountain South	625	277	901	0
Willow Creek	534	244	777	0
Segment 5 - Malheur				
Applicant's Proposed Action	635	250	884	0
Variation S5-A1	*105*	*36*	*141*	*0*
Variation S5-A2	*114*	*33*	*147*	*0*
Variation S5-B1	*37*	*19*	*56*	*0*
Variation S5-B2	*43*	*14*	*57*	*0*
Malheur S	682	291	974	0
Malheur A	665	267	932	0
Segment 6 - Treasure Valley				
Applicant's Proposed Action	440	173	613	0
Variation S6-A1	*138*	*67*	*205*	*0*
Variation S6-A2	*137*	*59*	*196*	*0*

Table 2-10. Summary of Estimated Ground Disturbance and Vegetation Clearing for the 500-Kilovolt Transmission Line Alternative Routes by Segment

Alternative	Temporary Disturbance (acres)[1,5]	Permanent Disturbance (acres)[2,5]	Total Disturbance (acres)[3,5]	Transmission Line Right-of-way Vegetation Clearing (acres)[4,5]
Variation S6-B1	*224*	*88*	*312*	*0*
Variation S6-B2	*217*	*91*	*309*	*3*

Table Notes:

[1]Temporary Disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure, except along the Bombing Range Road where structure works areas would be 90 by 250 feet), wire tensioning/pulling sites, which includes light duty fly yards (10 acres every 1.5 miles), and multi-use areas including fly yards (30-acre site located approximately every 15 miles);

[2]Permanent Disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (0.06 acre per structure every 1200 feet), communication stations (100 by 100 feet, one station approximately every 40 miles), Longhorn Substation (20 acres), and permanent access roads.

[3]Total Disturbance: the sum of construction and temporary disturbance

[4]Transmission Line Right-of-way Vegetation Clearing: Vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, juniper and mahogany woodland, and mixed conifer forest) and overlap with other disturbance in the B2H Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes at this time and is required to accurately identify locations of temporary and permanent access roads

[5]Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, they may not sum exactly.

Table 2-11. Summary of Estimated Ground Disturbance and Vegetation Clearing for the 230-Kilovolt and 138/69-Kilovolt Transmission Line Rebuilds (Segment 3)

Alternative	Total Length (miles)	Temporary Disturbance (acres)	Permanent Disturbance (acres)	Total Disturbance (acres)
230-kV transmission line relocation	0.9	0.96	0.04	1.00
138/69-kV transmission line relocation	5.3	1.19	0.15	1.34

Table Source: Idaho Power Company 2016

Table 2-12. Summary of Estimated Ground Disturbance and Vegetation Clearing for the 230-kV Double-circuit Rebuild (Segment 1)

Alternative	Total Length (miles)	Temporary Disturbance (acres)	Permanent Disturbance (acres)	Total Disturbance (acres)
Design Option 1 (partial removal of 69-kV line)	12.2	32.8	1.61	64.4
Design Option 2 (full removal of 69-kV line)	15.6	80.3	2.06	82.4
Design Option 3 (full removal of 69-kV line with step-down substation)	15.6	80.3	4.26	84.6

Table Source: Idaho Power Company 2016.

As described in Section 2.3.1.5, existing access roads would be used in their present condition without improvements, to the extent possible, to limit new disturbance for the B2H Project. In areas where improvements are required or deemed to be in the best interest of the B2H Project for future operation and maintenance use, the roads would be graded and/or graveled to provide a smooth all-weather travel surface. In areas where it is not practicable to use existing roads to fulfill the access requirements of the B2H Project, the existing road would be upgraded or a new road would be constructed. Since the B2H Project facilities have not been fully designed and locations of the transmission line facilities are not known, for the purpose of estimating impacts, ground disturbance associated with upgrading existing roads or constructing new roads was predicted through the development of a model. The predictive model was developed to (1) consider where existing roads can be used for construction, operation, and maintenance and where improved or new roads are required; (2) estimate potential ground disturbance resulting from the construction of new spur roads, improvement of existing access roads, and construction of new access roads; and (3) establish a baseline condition for access to conduct initial impact assessments for each resource evaluated in the EIS (e.g., visual resources, biological resources, land use, etc.).

Access levels are predictions of the general type of access (i.e., use existing roads, improve existing roads, or construct new roads) that would be required for every mile of each B2H Project alternative route, and the associated amount of disturbance the access level would create. Although the method incorporates road design criteria, it does not go to the level of actual road design. As a result, some variation is anticipated between the disturbance predictions generated from the access-level modeling and the actual disturbance of designed and engineered access roads. Access-level disturbance predictions have been developed to be conservative to ensure predictions for ground disturbance are not underestimated in relation to actual B2H Project disturbance and impacts. For purposes of analyzing impacts on resources and assessing likely ground disturbance associated with the B2H Project, the following six access levels, based primarily on slope, were developed based on information provided in the Applicant's description of the B2H Project:

- Access Level 1: Use existing roads (0 to 15 percent slope)
- Access Level 2: Use existing roads (greater than 15 percent slope)
- Access Level 3: Construct new access, flat to rolling terrain (0 to 8 percent slope)
- Access Level 4: Construct new access, rolling terrain (8 to 15 percent slope)
- Access Level 5: Construct new access, steep terrain (15 to 30 percent slope)
- Access Level 6: Construct new all-terrain vehicle (ATV) access, very steep terrain (greater than 30 percent slope)

In addition to ground disturbance, vegetation types that have the potential to grow more than 5 feet tall (e.g., aspen, montane forest, mountain shrub, pinyon-juniper, and riparian) would be cleared from the transmission line right-of-way. Areas of the right-of-way were identified where these vegetation communities occur. Ground disturbance in the right-of-way associated with access roads, structure work areas, wire-splicing sites, wire pulling-and-tensioning sites, and multi-use areas where these vegetative communities occur would overlap with the areas of transmission line right-of-way vegetation clearing.

Initial Impacts

As described in the previous section, based on estimated ground disturbance and resource inventory data reflecting the existing environment, each resource specialist determined the types and amounts of impacts that could occur on the resource (i.e., initial impacts). Computer-assisted models were developed to support this determination, which allowed the method used for each resource to be tailored to specific requirements, criteria, and assumptions for analysis of each resource. Qualitative and quantitative variables of resource sensitivity, resource quantity, and estimated ground disturbance were considered in predicting the intensity of initial impacts. The intensity of the environmental effect also can vary. In this analysis, the intensity of impacts was described in the following levels: high impact—that could cause substantial change or stress to an environmental resource or use (severe adverse or exceptional beneficial effects); moderate impact—that potentially could cause some change or stress to an environmental resource or use (readily apparent effects); low impact—that could be detectable but slight; and no identifiable impact. What constitutes a high, moderate, or low impact on a resource varies by resource and is described in the study methodology for each resource in Chapter 3, as are the assumptions for analysis made regarding each resource.

Mitigation Planning and Effectiveness

After initial impacts were identified for each resource, additional measures to mitigate impacts further for environmental protection (Table 2-13) were applied to avoid, minimize, or rectify/reduce over time moderate or high impacts. These selective mitigation measures were developed in collaboration with the BLM and cooperating agencies and include measures or techniques recommended or required (depending on land ownership) by BLM and USFS after initial impacts were identified and assessed. As such, selective mitigation measures provide a planning tool for minimizing potential adverse impacts. For some resources (e.g., biological and cultural resources), pedestrian surveys conducted using agency-approved protocols would be required prior to construction (and based on the final design of the B2H Project). The survey results would be used by the agencies to refine the mitigation requirements and further inform the final POD.

Once an alternative route is selected, the Applicant would coordinate with the BLM and other land-management agencies or landowners, as appropriate, to refine the implementation of mitigation at specific locations or areas based on final B2H Project design. For example, if a road closure was recommended, the Applicant would work with the applicable land-management agency or landowner to determine the specific method of road closure most appropriate for the site or area (e.g., barricading with a locking gate, obstructing access on the road using an earthen berm or boulders, revegetating the roadbed, or obliterating the road and returning it to its natural contour and vegetation). This detailed mitigation would be incorporated into the final POD prior to construction of the B2H Project and prior to receiving a notice to proceed for the B2H Project.

Table 2-13. Selective Mitigation Measures

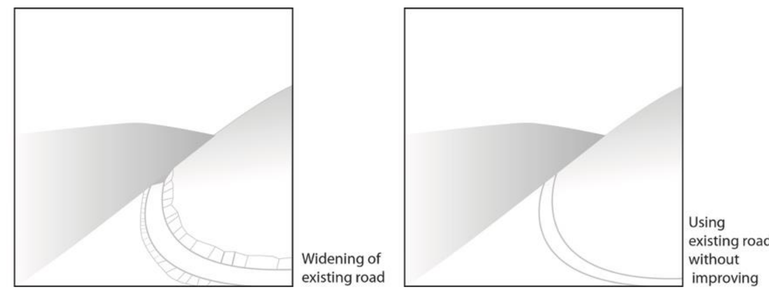
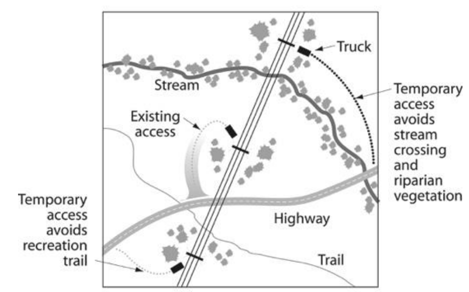
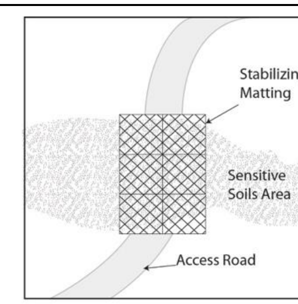
Mitigation Measure	Mitigation Examples	Application Phase[1]			Mitigation Effectiveness
		Design and Engineering	Construction	Operation and Maintenance	
1. Limit Widening of Existing Roads in Areas of Sensitive Soils, Vegetation, and/or Stream Crossings In areas where soils, vegetation, and/or streams are sensitive to disturbance, existing roads to be used for construction access and/or B2H Project maintenance would not, as much as possible/practicable, be widened or otherwise upgraded except in areas necessary to make existing roads passable and safe.		✓			Avoiding unnecessary access road upgrades would reduce the amount of habitat disturbed or removed and limit visual contrast that could occur from additional earthwork. Avoiding road upgrades would help in reducing the potential for indirect effects such as damage or loss of vegetation, spread of noxious weeds, harassment of wildlife, vandalism of cultural resources, and disturbance to sensitive land uses (e.g., parks, preservation, and recreation areas). Limiting ground disturbance would; minimize exposure of soils that are highly or moderately susceptible to wind or water erosion. The potential for increased erosion and sedimentation as a result of soil compaction and/or decompaction would be reduced as well as the loss of soil-stabilizing vegetation.
2. Use Existing Access or Stream Crossings, or both, for Sensitive Resources Avoidance Existing access or stream crossings, or both, would be used as much as possible or practicable for construction and maintenance to avoid disturbance of sensitive resources crossed by the B2H Project.			✓	✓	Similar to Selective Mitigation Measure 1, this mitigation measure would minimize ground-disturbing clearing and construction activities in areas of sensitive resources, thereby limiting the amount of habitat disturbed, removed, or fragmented. This would reduce the risk of isolation affecting the viability of special status wildlife subpopulations in these habitat areas. Visual contrast would be reduced by locating and constructing access routes, where they would be less visible from viewing locations. Minimizing ground-disturbing construction activities in the vicinity of fish-bearing streams and/or specially designated waters would limit soil disturbance, thereby minimizing the potential for increased erosion and sedimentation. In addition, limiting crossing of trails and other linear land uses would reduce direct conflicts with their use and function.
3. Use of Matting (Stabilization) in Sensitive Resource Areas To minimize ground disturbance in sensitive resource areas, matting or other similar practices for ground stabilization could be used for B2H Project access and work areas.			✓	✓	Similar to Selective Mitigation Measures 1 and 2, this selective mitigation measure would minimize ground disturbance in areas of sensitive resources. In particular, in areas where the construction of roads, work areas, or use of overland access, would directly affect resources. Use of matting such as composite or timber mats, would minimize rutting as well as minimize effects on cultural resources located along access routes, after appropriate site recordation in accordance with Section 106 requirements.

Table 2-13. Selective Mitigation Measures

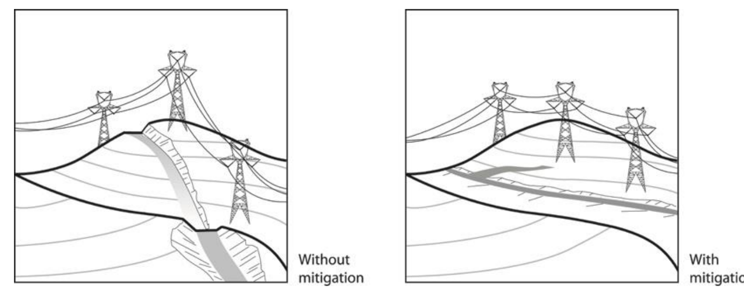
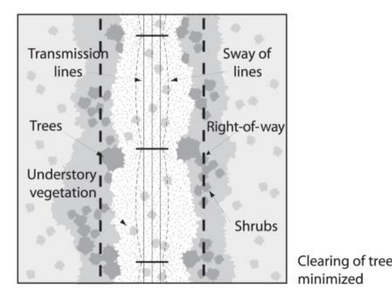
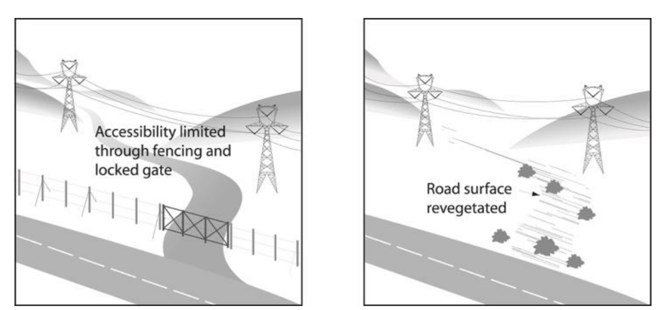
Mitigation Measure	Mitigation Examples	Application Phase[1]			Mitigation Effectiveness
		Design and Engineering	Construction	Operation and Maintenance	
4. Minimize Slope Cut and Fill for Access and Work Areas The alignment of new access roads would follow the landform contours where practicable to minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape. Modification to the size and/or configuration of the structure work areas facilitated by minor structure design adjustments (e.g., altering leg length) would be used to minimize cut and fill slopes and blend contours with existing topography. Additionally, soil amendments or mineral emulsions would be applied, or grading techniques such as slope rounding and slope scarification would be used to blend road and structure work area cuts into the landscape in areas of steep terrain where grading is necessary, in rocky areas, or where soil color would create strong landscape contrasts.		✓			Following the existing land contours and terrain minimizes the cutting and filling of slopes and reduces the potential for the form and line of the landscape to be visually interrupted. This results in reducing visual contrast between the exposed ground of the road or structure work areas and the surrounding environment. Additionally, the application of soil/rock coloring would further reduce the visual contrast between exposed ground and the surrounding environment. Minimizing slope cut and fill also reduces ground disturbance and potential habitat fragmentation. Water runoff is less likely to accelerate soil erosion, thus minimizing (1) potential damage from rutting and drilling, which, in turn, protects adjacent vegetation and (2) potential sedimentation into nearby fish-bearing streams.
5. Minimize Vegetation Clearing for Operational Clearances Removal of vegetation in the right-of-way would be minimized to limit disturbance to timber resources, reduce disturbance to agricultural production, reduce visual contrast, and protect sensitive habitat, subject to structure- and conductor-clearance requirements. Trees and other vegetation would be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate. Refer to EIS Section 2.3.3.2 for more description of vegetation management.			✓	✓	Selectively removing vegetation (i.e., trees, crops, other vegetative cover) in and along the edges of the right-of-way, or limiting the width of the area cleared in the right-of-way, reduces disruption of habitat, minimizes removal of timber resources, allows compatible land uses to continue, and reduces the visual contrast between the right-of-way and the surrounding environment. Minimizing the number of trees cleared in sensitive habitats would lessen impacts on wildlife habitat connectivity and avian nesting habitat. Minimizing disturbance to agricultural crops reduces production losses and maintains topsoil. Furthermore, feathering the edges of the right-of-way instead of cutting trees and vegetation in a straight line results in a more gradual modification to the environment and the hard visual line created by the cleared right-of-way/forest interface. Minimizing vegetation clearing also reduces the potential for erosion and potential sedimentation in nearby fish-bearing streams.
6. Limit New or Improved Accessibility to Areas Previously Inaccessible In areas of sensitive habitat or areas sensitive to additional public access, new or improved access in the B2H Project area would be limited. New or improved access would be closed or rehabilitated using the most effective and least environmentally damaging methods appropriate to that area (in consultation with the landowner or land-management agency). Methods for road closure or management may include installing locking gates, obstructing the path (e.g., earthen berms, boulders, redistribution of woody debris), revegetating and mulching the surface of the roadbed to make it less apparent, or restoring the road to its natural contour and vegetation.			✓	✓	Closing access roads where they are not needed after construction protects the area resources from further disturbance for the reasons described in Selective Mitigation Measure 1. The closing of these access roads would restore existing natural features as well as limit public access to wildlife populations, reduce stress and disturbance to wildlife, special status wildlife and habitats during critical life-cycle periods, anthropogenic disturbance, and traffic; consequently reducing erosive attributes (e.g., soil compaction, decompaction, rutting). Additionally, visual contrast would be reduced through restoring existing features in naturally intact and highly visible areas.

Table 2-13. Selective Mitigation Measures

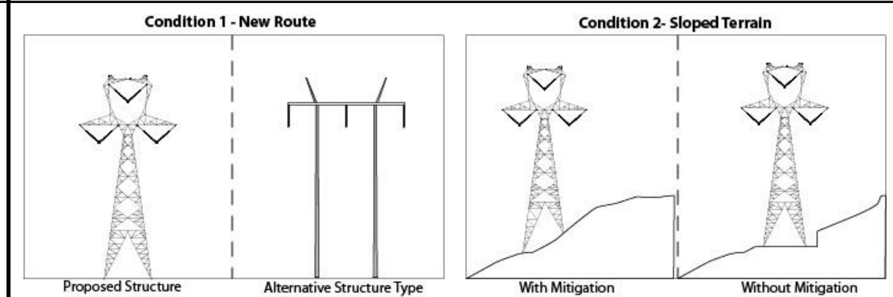
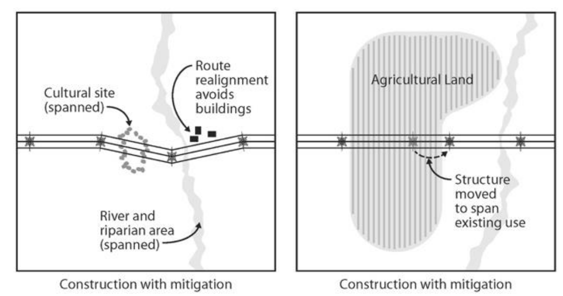
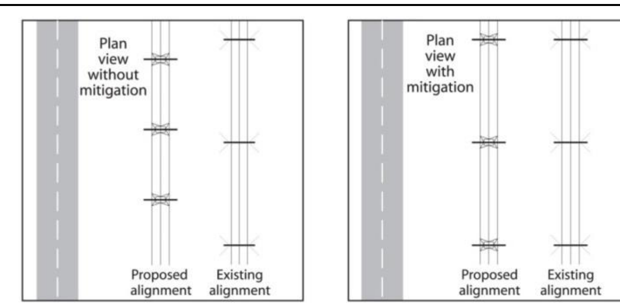
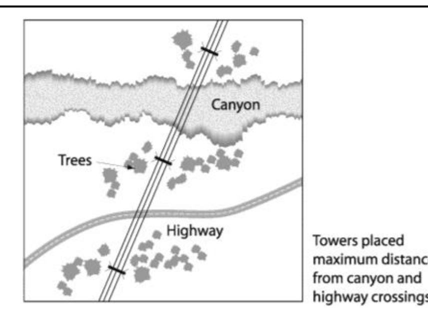
Mitigation Measure	Mitigation Examples	Application Phase[1]			Mitigation Effectiveness
		Design and Engineering	Construction	Operation and Maintenance	
7. Tower Design Modification The tower design may be modified to reduce resource impacts. Modifications include use of alternative structure type, modifying tower height, modifying tower leg lengths to accommodate varied terrain, and changing tower finish type.		✓			Flexibility in designing the tower, or use of different tower types, would allow tower structures to be more adapted to specific site situations. For example, in areas where there are sensitive views and an existing corridor, the proposed line could parallel an existing line and match the type of tower used along the existing line, minimizing visual contrast. In situations where an alternative structure may be shorter in height, there would be opportunities to screen or backdrop the structures against topography, resulting in reduced visual contrast. Additionally, tower design modification could be used to minimize perching opportunities for aerial predators where sensitive prey species occur (e.g., sage-grouse).
8. Span and/or Avoid Sensitive Features Within the limits of standard tower design, structures would be located to allow conductors to avoid identified sensitive features such as dwellings/buildings and span sensitive existing land uses, natural features, hazardous substance remediation sites, and cultural resource sites. This could be accomplished through methods such as selective tower placement, spanning sensitive features, or realigning the B2H Project centerline (micro-siting).		✓	✓		Flexibility in the placement of towers allows sensitive features to be avoided. Realigning the towers along an alternative route or realigning the alternative route (micro-siting), to the extent practicable, can result in avoiding or minimizing direct and indirect impacts on resources (e.g., cultural, biological, fish-bearing streams, and visual), as well as land uses (e.g., agriculture, parks, hazardous substance remediation, and recreation areas). This mitigation measure would reduce potential loss, degradation, and fragmentation of wildlife habitat; decreasing the risk of isolation between habitat areas and subpopulations. Additionally, the transmission line or associated facilities could be realigned, to the extent practicable, in areas with high concern viewsheds to locate structures to result in reduced visual contrast and visibility.
9. Match Transmission Line Spans Standard tower design would be modified to correspond with spacing of existing transmission line structures of similar voltage and/or span lengths, where feasible and within limits of standard tower design, to reduce visual contrast and/or potential operational conflicts. The normal span would be modified to correspond with existing towers, but not necessarily at every location.		✓			Matching tower spacing with existing parallel lines reduces the visual space occupied by the towers and minimizes the amount of contrast between the man-made structures and the landscape.
10. Maximize Span at Crossings At highway, canyon, and trail crossings, towers would be placed at the maximum feasible distance from the crossing within limits of standard tower design and in conformance with engineering and Applicant requirements to reduce visual impacts and potential impacts on recreation values and to increase safety at these locations from potential off-highway vehicle collisions.		✓			Placing towers at a maximum distance from major or sensitive crossings (e.g., roads and trails) can sometimes be done to reduce the dominance of views resulting from locating structures directly adjacent to these features. Locating structures directly adjacent to highways or over waterways can create potential safety hazards (i.e., vehicle collision with tower). Conversely, placing the towers so that the crossing is at mid-span means the clearance between the conductor and the ground is at its lowest.

Table 2-13. Selective Mitigation Measures

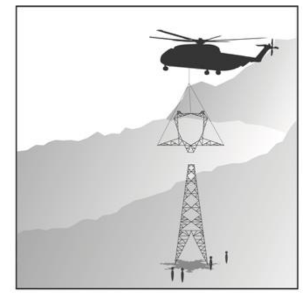
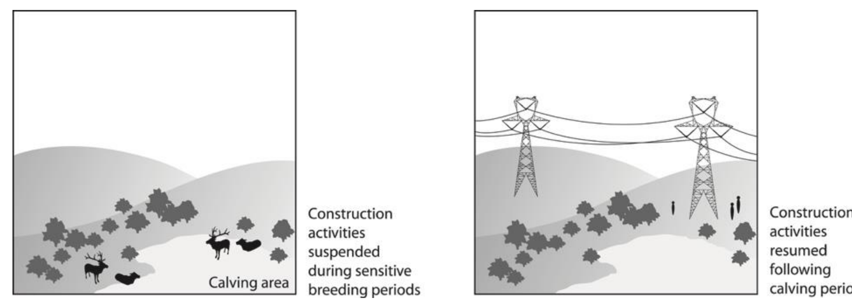
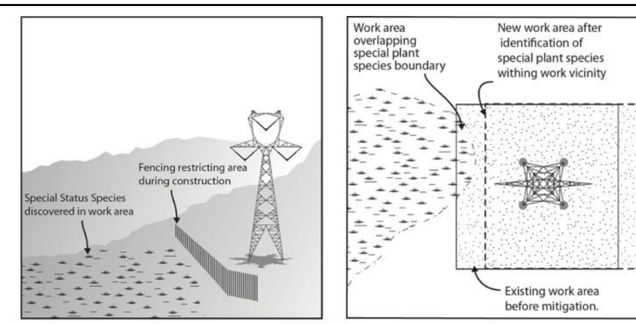
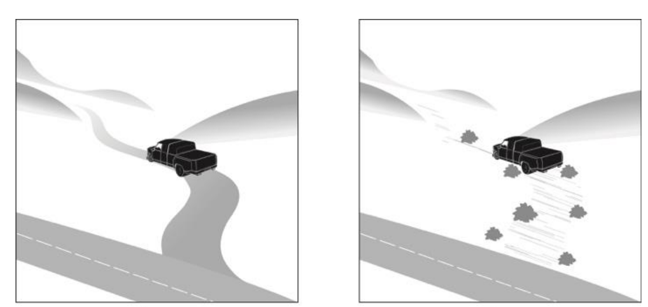
Mitigation Measure	Mitigation Examples	Application Phase[1]			Mitigation Effectiveness
		Design and Engineering	Construction	Operation and Maintenance	
11. Helicopter-Assisted Construction Helicopter-assisted placement of towers during construction and maintenance may be used where practicable to reduce surface impacts in environmental constraint areas or steep terrain locations.			✓	✓	Using helicopters to place towers in steep terrain or otherwise sensitive areas reduces land-use and natural-resource impacts as a result of on-the-ground construction activities. Limiting ground disturbance would reduce the loss of vegetation, accelerated soil erosion, potential damage to cultural resources, and visual impacts. This mitigation is most effective in specially designated areas where the existing access roads would require extensive improvement or the construction of new access roads is not desired, to meet management prescriptions.
12. Seasonal and Spatial Fish and Wildlife Restrictions To minimize disturbance to identified fish and wildlife species during sensitive periods, construction, operation, and maintenance activities would be restricted in designated areas unless exceptions are granted by the Authorized Officer or his/her designated representative and other applicable regulatory agencies (e.g., U.S. Fish and Wildlife Service [USFWS], National Oceanic and Atmospheric Administration Fisheries, state wildlife agencies). A list of seasonal and spatial restriction for biological resources is presented in Appendix B of the EIS.	 		✓	✓	Restricting construction activities or maintenance during identified sensitive periods would avoid potential disturbance of fish and wildlife during critical periods of their life cycles.
13. Spatial Plant Restrictions To minimize disturbance to identified plant species, construction, operation, and maintenance activities would be restricted in designated areas unless exceptions are granted by the Authorized Officer or his/her designated representative and other applicable regulatory agencies (e.g., U.S. Fish and Wildlife Service, state wildlife agencies).	 Construction with mitigation Plan view		✓	✓	Restricting construction activities or maintenance during identified sensitive periods would avoid potential disturbance of plants during critical periods of their life cycles.
14. Overland Access In addition to using overland travel in work areas, overland access to work areas may be used to reduce resource impacts. The construction contractor would use overland access in areas where no grading would be needed to access work areas. Overland access would consist of drive-and-crush (i.e., vehicular travel to access a site without significantly modifying the landscape, cropping vegetation, or removing soil) and/or clear-and-cut travel (removal of all vegetation while leaving the root crown intact to improve or provide suitable access for equipment). Prior to commencement of work activities, overland access routes would be staked. Routes would be specified in the Plan of Development (POD). Use of overland access routes would be restricted based on dry or frozen soil conditions, seasonal weather conditions, and relatively flat terrain.	 Without Mitigation With Mitigation		✓	✓	Overland access, where allowed, would avoid or minimize the removal of surface soil and vegetation where soils are susceptible to wind and water erosion, reducing the potential for erosion and loss of habitat. Avoiding constructing a new road would reduce the potential for increased traffic and the associated indirect effects including the introduction of invasive weeds and special status wildlife habitat fragmentation.

Table 2-13. Selective Mitigation Measures

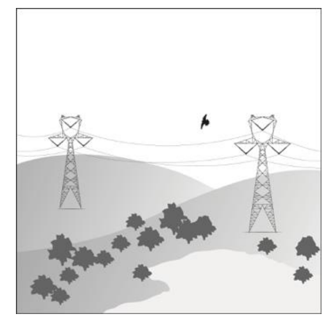
Mitigation Measure	Mitigation Examples	Application Phase[1]			Mitigation Effectiveness
		Design and Engineering	Construction	Operation and Maintenance	
15. Flight Diverters and Perch Deterrents Shield wires, guy wires, and overhead optical ground wire along designated portions of the transmission line with a high potential for avian collisions would be marked with flight diverters or other Bureau of Land Management or U.S. Forest Service approved devices in accordance with agency requirements and Reducing Avian Collisions with Power Lines, The State of the Art in 2012 (APLIC 2012). Portions of the transmission line adjacent to or that cross through waterfowl and general migratory pathways or habitat for high priority species may be marked to reduce the risk of avian collisions. This measure also may include use of devices to deter raptors from perching on transmission line structures in habitat for high priority prey species (e.g., sage-grouse). The specific segments where these devices would be used would be determined in consultation with the appropriate agencies.			✓	✓	Marking guy wires and overhead optical ground wires on segments of the transmission lines that are adjacent to or cross through high-priority avian habitat or where risk of avian collisions are elevated would minimize the risk of avian collision.

Table Note: [1]These three columns refer to the phase and/or phases of the B2H Project during which selective mitigation measures are relevant (i.e., during design and engineering, construction, and/or operation and maintenance).

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Additionally, mitigation to offset or compensate for impacts on some qualifying resources may require mitigation measures and conservation actions to achieve land-use plan goals and objectives and provide for sustained yield of natural resources on public lands, while continuing to honor the agency's multiple-use mission. Reasonably foreseeable residual effects on resources that are expected to remain after the application of mitigation measures that meet the following criteria warrant compensatory mitigation:

- Residual effects that, if compensatory mitigation were not required, would inhibit achieving compliance with laws, regulations, and/or policies.
- Residual effects that, if compensatory mitigation were not required, would inhibit achieving land-use plans objectives.
- Residual effects on important, scarce, or sensitive resources that have been previously identified in a mitigation strategy as warranting compensatory mitigation.
- Residual effects to important, scarce, or sensitive resources that are identified through a NEPA process as warranting compensatory mitigation.

The sequence of mitigation action would comply with the mitigation identified by the CEQ (40 CFR 1508.20) and BLM's Draft Manual Section-1794 – Regional Mitigation (interim policy) and could include measures for the BLM to consider for compensating for an impact by replacing or providing substitute resources or environments. Examples include creation or restoration of wetlands; offsite vegetation treatments to improve sage-grouse or migratory bird habitat; purchase of property or conservation easements to provide long-term protection for sage-grouse or migratory bird habitats; or appropriate mitigation for impacts on designated National Scenic and/or Historic Trails or those trails recommended as suitable for congressional designation. Appendix C contains a Mitigation Framework. The Mitigation Framework (hereafter Framework) is intended to be a framework, not a site-specific mitigation plan, to discuss how the mitigation hierarchy, including compensatory mitigation, is applied to the direct and indirect impacts of the project. The Framework will (1) describe how avoidance and minimization would eliminate and/or reduce impacts; (2) identify remaining (i.e., residual) impacts to be addressed through compensatory mitigation; and (3) establish the process to assess the compensatory mitigation obligation to achieve a no net loss, or as required or appropriate, a net benefit to resources. Upon identification of the selected route in the Record of Decision and following final engineering and design, the Mitigation Framework will be used to prepare a final Compensatory Mitigation Plan. The Compensatory Mitigation Plan will be prepared using the mitigation framework as a guide for assessing the direct and indirect impacts based on an engineered and designed alignment, and identify a suite of site-specific compensatory mitigation options for selection and implementation under the review and guidance of the cooperating agencies. The goal of the Compensatory Mitigation Plan will be to provide a net benefit to sage-grouse habitat and for other resources, a no net loss and where required or appropriate, a net benefit. Cooperating agencies will review to establish consistency with the guidance and standards and principles for their particular agency and a recommendation will be made to the Authorized Officer for approval prior to any issuance of notices to proceed for the long-term right-of-way grant.

This approach is consistent with the Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment (November 3, 2015); Secretarial Order No. 3330, Improving Mitigation Policies and Practices of the Department of the Interior; the BLM's obligations under the FLPMA, NEPA, Mineral Leasing Act of 1920, as amended, CEQ Regulations; and the USDI Manual 600 DM 6: Landscape Scale Mitigation Policy and WO IM2013-142: Draft MS-1794 – Regional Mitigation.

In addition to any compensatory mitigation required by the BLM, the Applicant may be required to provide compensatory mitigation for (1) effects on fish and wildlife habitat in accordance with the Energy Facility Siting Council Fish and Wildlife Habitat standard (OAR 345-022-0060), which incorporates the Oregon Department of Fish and Wildlife (ODFW) Habitat Mitigation Policy (OAR 635-415-0025), (2) effects on forested habitat on the Wallowa-Whitman National Forest, (3) effects on species listed under the ESA included as terms and conditions of the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the U.S. Fish and Wildlife Service (USFWS) Biological Opinions, and (4) effects on wetlands, streams, and other aquatic resources regulated by the Clean Water Act Section 404 permitting process and other U.S. Army Corp of Engineer (USACE) permits. The requirements of these agencies are described in Appendix C.

Residual Impacts

Residual impacts are the environmental effects that remain after selective mitigation measures are applied. After the locations of potential residual impacts were identified, the intensities of such potential residual impacts anticipated to occur from construction along the reference centerline of the alternative routes were assessed and mapped (Volume II). They are discussed in the Environmental Consequences sections for each resource in Chapter 3.

The description of residual effects anticipated for each alternative route should be reviewed in conjunction with the resource inventory maps provided in Volume II. Several of the alternative routes considered in this EIS share common links and would result in similar environmental effects. Rather than repeating information, in most cases the descriptions of alternative routes have been abbreviated, as appropriate, to focus on the effects unique to an alternative route.

Screening and Comparing Alternatives

Through a systematic analysis, as shown in Figure 2-21, the alternative routes were screened and compared to narrow the number of alternative routes and to determine the most environmentally acceptable routes to be addressed in the EIS.

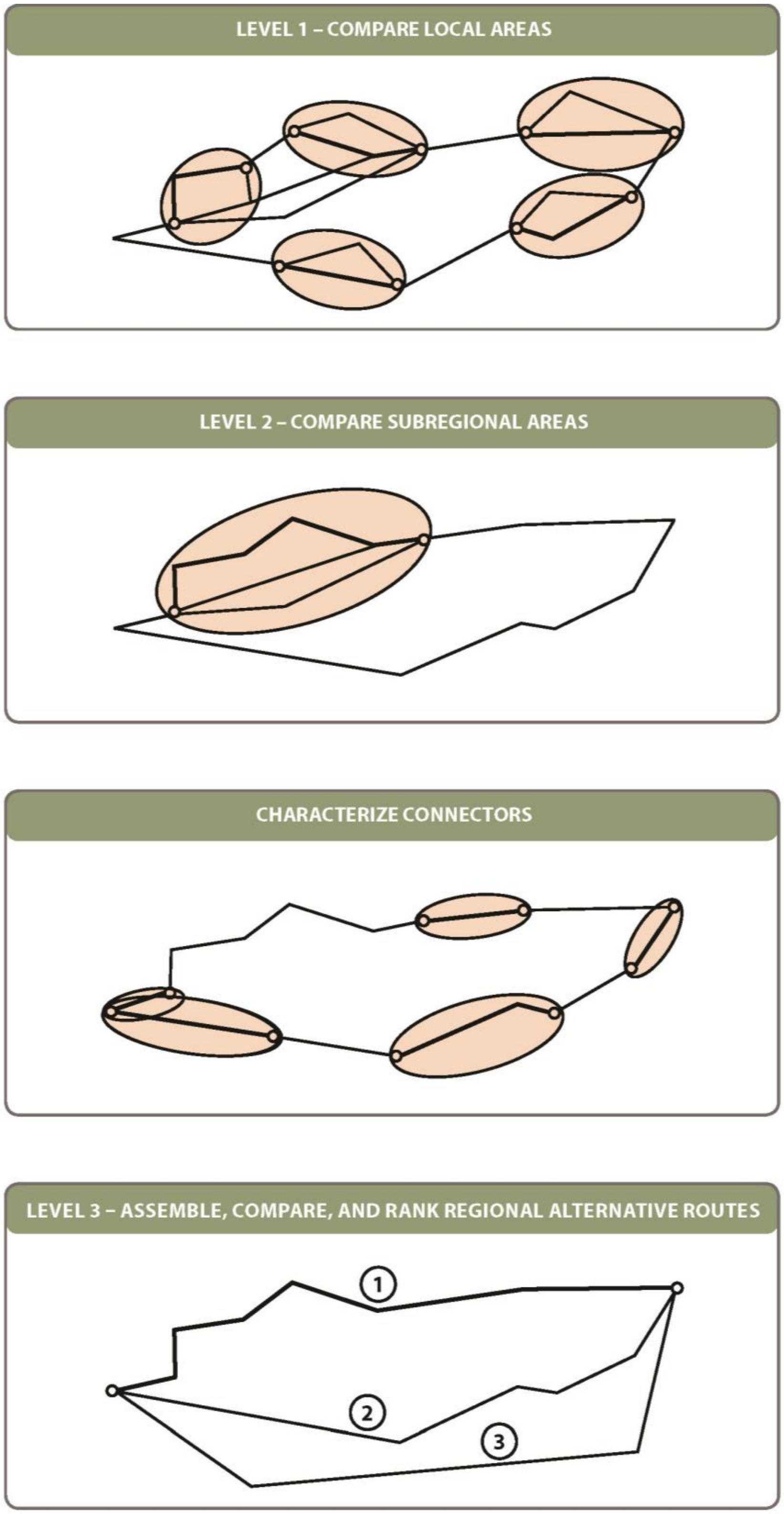

Figure 2-21. Alternative Routes Screening and Comparison Approach

Once the impacts along each of the alternative routes had been analyzed, the alternative routes were screened to characterize the impacts and compared to identify which were most environmentally preferable (in accordance with criteria at 40 CFR 1502.14). Screening and comparing the routes was conducted progressively in three levels, as illustrated in Figure 2-21, for all of the alternative routes. Level 1 screening focused on comparison of route variations in localized areas. Level 2 screening focused on larger subregional areas. Level 3 screening involved combining the suitable segments of routes from the first two levels of screening to form complete routes in each segment.

The results of the screening and comparison establish the basis for characterizing the impacts of remaining, complete alternative routes and comparing those alternative routes. The results of the comparison of alternative routes are presented in Section 2.6.

2.5.2 Transmission Line Alternative Routes

The B2H Project area is organized into the same six segments broadly described in the Draft EIS and are based generally on similar geography, natural features, drainages, resources, and/or land uses. The B2H Project segments, from north to south, are as follows:

- Segment 1—Morrow-Umatilla
- Segment 2—Blue Mountains
- Segment 3—Baker Valley
- Segment 4—Brogan
- Segment 5—Malheur
- Segment 6—Treasure Valley

There are multiple alternative routes in each segment. Each segment begins and ends where the alternative routes meet and intersect at a common point, or segment node. This section provides a description of each alternative route, and localized variations, if applicable, in each of the six segments. The alternative routes analyzed for the Final EIS include the alternative routes analyzed in the Draft EIS and the route variations resulting (1) from colocating the alignment of the proposed transmission line closer to existing transmission lines and (2) from recommendations received in comments on the Draft EIS. The BLM took a hard look at the route variations and determined the route variations are all within the B2H Project area and, additionally, the route variations incorporated into the network of alternative routes are within the spectrum of alternatives already analyzed; therefore, the EIS does not require supplementation.

Map 2-6 shows the six segments. Maps 2-7a through 2-7f show the alternative routes and route variations in each segment. Table 2-14 is a list of the alternative routes and variations and discloses the approximate disturbance anticipated along each alternative route and route variation. Then each alternative route is described and is accompanied by a small diagram showing the alignment of that alternative route.

NOTE: The term "Proposed Action" refers to Idaho Power Company's proposal to construct, operate, and maintain a 500-kV transmission line from the area of Boardman, Oregon, to the area of Hemingway, Idaho. The term "Applicant's Proposed Action Alternative" is the Applicant's preferred route.

Table 2-14. Alternative Routes and Variations by Segment

Alternative Route	Link(s)	Length (Miles[1])
Segment 1 – Morrow-Umatilla		
Applicant's Proposed Action (modified to Longhorn Substation and West of Bombing Range Road)	1-1, 1-3, 1-7,1-27, 1-35, 1-43,1-45, 1-51,1-53, 1-59, 1-60, 1-61, 1-50, 1-63, 1-65, 1-71, 1-77	91.9
Variation S1-B1	*1-77*	*6.4*
Variation S1-B2	*1-73, 1-75*	*6.4*
East of Bombing Range Road	1-1, 1-3, 1-11, 1-25, 1-33, 1-41, 1-43, 1-45, 1-51, 1-53, 1-59, 1-60, 1-61, 1-50,1-63, 1-65, 1-71,1-77	92.3
Applicant's Proposed Action – Southern Route	1-1, 1-3, 1-7, 1-27, 1-35, 1-43, 1-45, 1-51, 1-53, 1-59, 1-60, 1-79,1-83, 1-66, 1-65, 1-71, 1-77	99.1
West of Bombing Range Road – Southern Route	1-1, 1-3, 1-7, 1-27, 1-35, 1-36, 1-38, 1-62, 1-64, 1-66, 1-65, 1-71, 1-77	95.6
Longhorn	1-5, 1-9, 1-15, 1-45, 1-51, 1-53, 1-59, 1-60, 1-61, 1-50, 1-63, 1-65, 1-71, 1-77	88.2
Interstate 84	1-5, 1-9, 1-19, 1-23, 1-31, 1-39, 1-49, 1-50, 1-63, 1-65, 1-71, 1-77	84.7
Variation S1-A1 (230-kV)	*1-31*	*18.5*
Variation S1-A2 (230-kV)	*1-37*	*18.5*
Interstate 84 – Southern Route	1-5, 1-9, 1-19, 1-23, 1-31, 1-39, 1-49, 1-50, 1-81, 1-83, 1-66, 1-65, 1-71, 1-77	93.4
Segment 2 – Blue Mountains		
Applicant's Proposed Action	2-1, 2-5, 2-15, 2-20, 2-30, 2-35, 2-45, 2-47, 2-50, 2-52, 2-60, 2-75, 2-85, 2-95	33.8
Variation S2-A1	*2-1, 2-5*	*2.8*
Variation S2-A2	*2-3, 2-7*	*2.9*
Variation S2-B1	*2-30, 2-35*	*3.7*
Variation S2-B2	*2-25*	*3.8*
Variation S2-C1	*2-45, 2-47, 2-50*	*9.3*
Variation S2-C2	*2-48*	*8.8*
Variation S2-E1	*2-60*	*2.3*
Variation S2-E2	*2-55, 2-65*	*2.6*
Variation S2-F1	*2-75, 2-85, 2-95*	*12.1*
Variation S2-F2	*2-70, 2-80, 2-90*	*12.2*

Table 2-14. Alternative Routes and Variations by Segment

Alternative Route	Link(s)	Length (Miles[1])
Glass Hill	2-1, 2-5, 2-15, 2-20, 2-30, 2-40, 2-42, 2-47, 2-50, 2-52, 2-60, 2-75, 2-85, 2-95	33.7
Variation S2-D1 (Glass Hill)	*2-42, 2-47*	*4.3*
Variation S2-D2 (Glass Hill)	*2-46*	*4.1*
Mill Creek	2-3, 2-7, 2-10, 2-12, 2-63, 2-65, 2-70, 2-80, 2-90	34.0
Segment 3 – Baker Valley		
Applicant's Proposed Action	3-4, 3-22, 3-26, 3-28, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92	55.2
Variation S3-A1	*3-4, 3-22*	*12.4*
Variation S3-A2	*3-10, 3-12, 3-14, 3-20*	*12.2*
Variation S3-B1	*3-26, 3-28*	*13.9*
Variation S3-B2	*3-24, 3-31, 3-37, 3-41, 3-46, 3-47, 3-48*	*14.4*
Variation S3-B3	*3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48*	*14.7*
Variation S3-B4	*3-24, 3-31, 3-32, 3-36, 3-38, 3-39, 3-43, 3-44, 3-48*	*14.3*
Variation S3-B5	*3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48*	*14.0*
Variation S3-C1	*3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92*	*21.1*
Variation S3-C2	*3-56, 3-42, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92*	*21.7*
Variation S3-C3	*3-56, 3-60, 3-62, 3-64, 3-72, 3-76, 3-88, 3-92*	*21.1*
Variation S3-C4	*3-56, 3-60, 3-62, 3-68, 3-70, 3-72, 3-76, 3-88, 3-92*	*21.4*
Variation S3-C5	*3-56, 3-60, 3-62, 3-66, 3-71, 3-73, 3-94*	*21.0*
Variation S3-C6	*3-56, 3-60, 3-74, 3-90, 3-94*	*24.7*
Flagstaff A	3-4, 3-22, 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92	55.3
Timber Canyon	3-1, 3-2, 3-6, 3-8, 3-80, 3-82, 3-86, 3-88, 3-92	70.3
Flagstaff A – Burnt River Mountain	3-10, 3-12, 3-14, 3-20, 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48, 3-52, 3-54, 3-56, 3-60, 3-62, 3-64, 3-72, 3-76, 3-88, 3-92	55.3
Flagstaff B	3-4, 3-22, 3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92	56.0
Flagstaff B – Burnt River West	3-10, 3-12, 3-14, 3-20, 3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48, 3-52, 3-54, 3-56, 3-60, 3-62, 3-66, 3-71, 3-73, 3-94	55.7
Flagstaff B – Durkee	3-4, 3-22, 3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48, 3-52, 3-54, 3-56, 3-60, 3-74, 3-90, 3-94	59.6
Segment 4 – Brogan		
Applicant's Proposed Action	4-1, 4-10, 4-11, 4-13, 4-25, 4-45, 4-50, 4-65, 4-70	40.1
Variation S4-A1	*4-1, 4-10, 4-11, 4-13*	*5.9*
Variation S4-A2	*4-1, 4-5, 4-15, 4-17*	*6.0*

Table 2-14. Alternative Routes and Variations by Segment		
Alternative Route	**Link(s)**	**Length (Miles[1])**
Variation S4-A3	*4-3, 4-11, 4-12, 4-17*	*6.1*
Tub Mountain South	4-1, 4-5, 4-15, 4-17, 4-20, 4-30, 4-75	40.5
Willow Creek	4-1, 4-10, 4-11, 4-13, 4-25, 4-35, 4-40, 4-60, 4-70	34.6
Segment 5 – Malheur		
Applicant's Proposed Action	5-1, 5-5, 5-10, 5-15, 5-40, 5-50, 5-55, 5-65, 5-70, 5-75	40.4
Variation S5-A1	*5-15*	*7.4*
Variation S5-A2	*5-20*	*7.4*
Variation S5-B1 (Owyhee River Crossing)	*5-50, 5-55, 5-65*	*2.5*
Variation S5-B2 (Owyhee River Crossing)	*5-45*	*2.8*
Malheur S	5-1, 5-5, 5-25, 5-30, 5-75	43.5
Malheur A	5-1, 5-5, 5-25, 5-35	43.1
Segment 6 – Treasure Valley		
Applicant's Proposed Action	6-1, 6-10, 6-20, 6-25, 6-35	28.0
Variation S6-A1	*6-10, 6-20*	*9.3*
Variation S6-A2	*6-5, 6-15*	*8.9*
Variation S6-B1	*6-25*	*14.4*
Variation S6-B2	*6-30*	*14.1*
Table Note: [1]Mileage calculations are approximate.		

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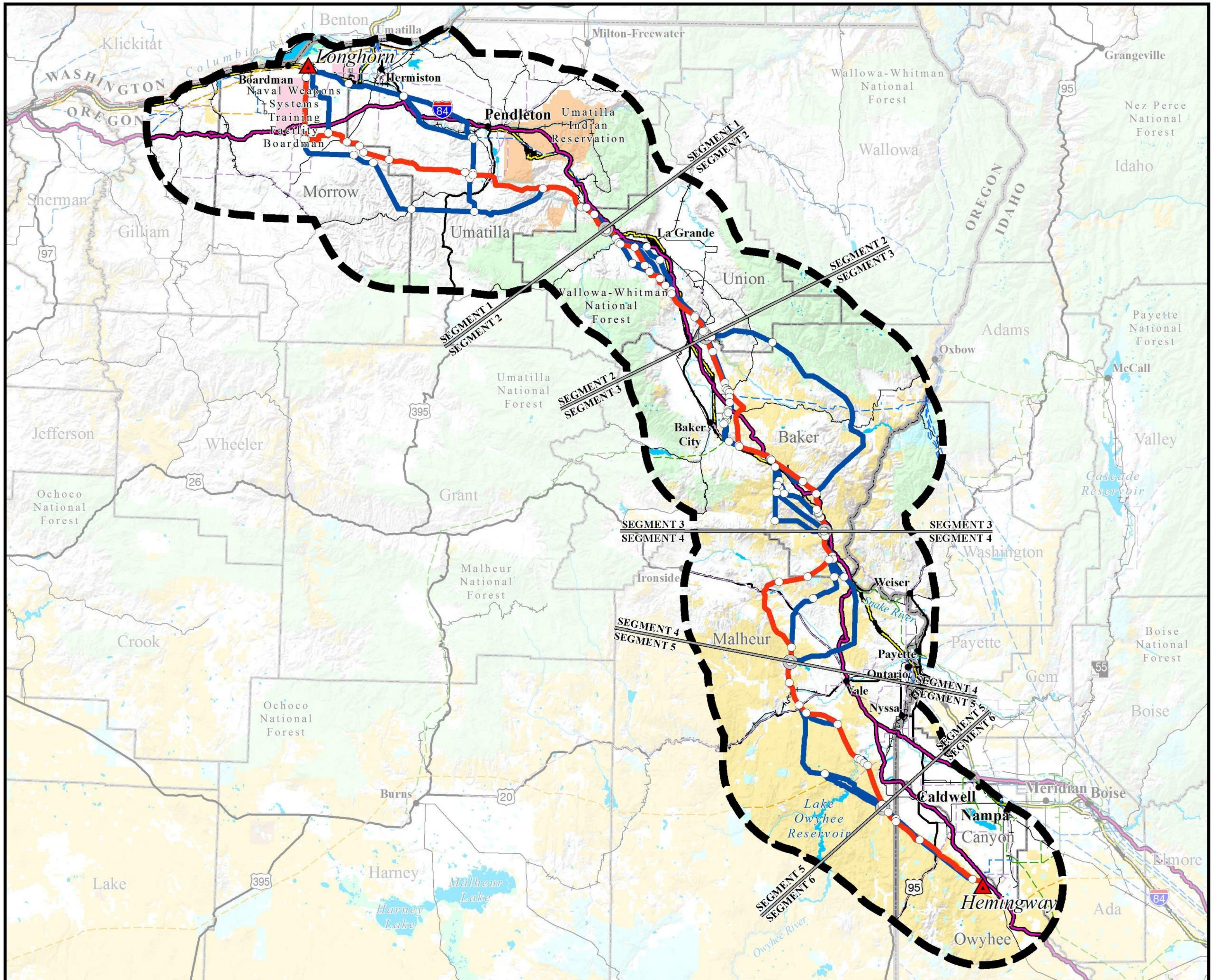

Map 2-6

Segments

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Other Federal
- State Land
- Private Land

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007,
Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10 20 30 40
Miles
1:1,393,920 or 1 inch = 22 miles

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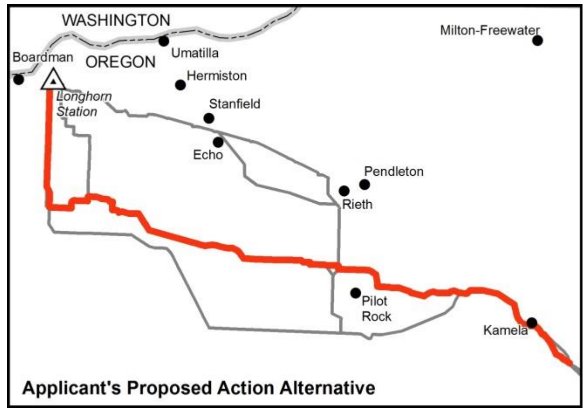
2.5.2.1 Segment 1—Morrow-Umatilla

Segment 1 begins at the planned Longhorn Substation in Morrow County and ends west of La Grande in Union County on the Wallowa-Whitman National Forest. The seven alternative routes and two areas of local variations in Segment 1 are shown in Map 2-7a.

Applicant's Proposed Action Alternative [Links 1-1, 1-3, 1-7,1-27, 1-35, 1-43, 1-45, 1-51,1-53, 1-59, 1-60, 1-61, 1-50, 1-63, 1-65, 1-71, 1-77; 91.9 miles]



Comments on the Draft EIS from the Applicant indicated a change in the Applicant's Proposed Action from using the Grassland or Horn Butte Substation to using the proposed Longhorn Substation. The Longhorn Substation was addressed in the Draft EIS; however, the Applicant Proposed Action Alternative route now exits the Longhorn Substation and heads south on the west side of Bombing Range Road to a point where the route variation turns to the east and then continues along the Applicant's Proposed Action Alternative described in the Draft EIS.

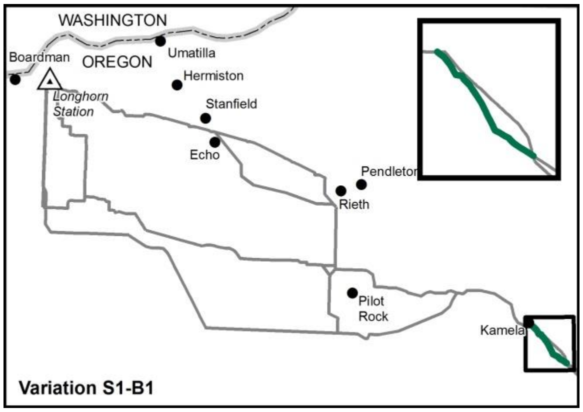
The Applicant's Proposed Action Alternative in Segment 1 exits the planned Longhorn Substation to the south, crossing the intersection of Interstate 84 and U.S. Highway 730, where the transmission line would then cross to the west side of Bombing Range Road. The alternative continues along the west side of Bombing Range Road for approximately 12 miles, within a 90-foot-wide use area, currently occupied by a 69-kV transmission line owned by BPA, on the NWSTF Boardman, before crossing the road and turning to the east traversing areas of irrigated and dryland agriculture for approximately 40 miles north of Butter Creek and Jack Canyon. The transmission line would cross U.S. Highway 395 between the community of Pilot Rock and the McKay Creek National Wildlife Refuge before ascending the Blue Mountains, south of the Umatilla Indian Reservation, across McKay Creek and onto the Wallowa-Whitman National Forest. This alternative does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice and continues to the southeast between the interstate and the Blue Mountain Forest State Scenic Corridor in Railroad Canyon.

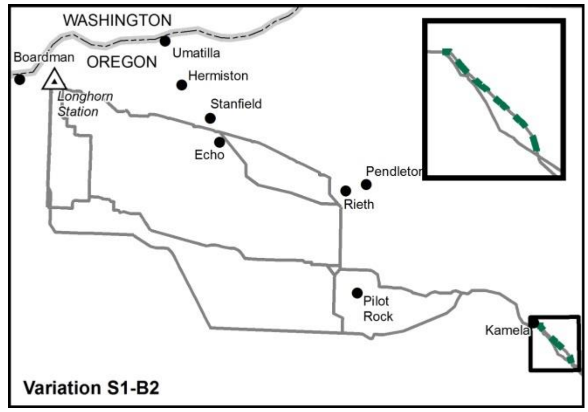
This alternative (as well as the Applicant's Proposed Action – Southern Route Alternative and West of Bombing Range Road – Southern Route Alternative) would be designed using two tower types. From Longhorn Substation for about 3.0 miles, the transmission line structures typically would be 170-feet tall self-supported steel lattice with typical spans of approximately 1,500 feet between structures. From that point to the south, where the transmission line would be adjacent to the NWSTF Boardman, structures would be no taller than 100 feet tubular steel H-frame with typical spans of 400 to 600 feet between structures. Where the transmission line would no longer be adjacent to the NWSTF Boardman, the structure type would revert to 170-foot tall self-supported steel lattice.

VARIATION S1 AREA B (KAMELA, WALLOWA-WHITMAN NATIONAL FOREST AREA)

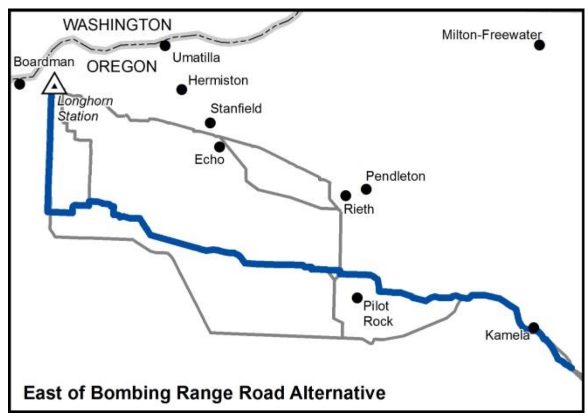
Variation S1-B1 (Link 1-77; 6.4 miles) shares the same alignment as all of the alternative routes in Segment 1 located between Interstate 84 and Blue Mountain Forest State Scenic Corridor in Railroad Canyon. This variation does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice.

Variation S1-B2 (Links 1-73; 1-75, 6.4 miles) separates from the Segment 1 alternatives, south of Kamela, to parallel the existing 230-kV transmission line crossing Interstate 84 twice before rejoining the Segment 1 alternatives south of the interstate.

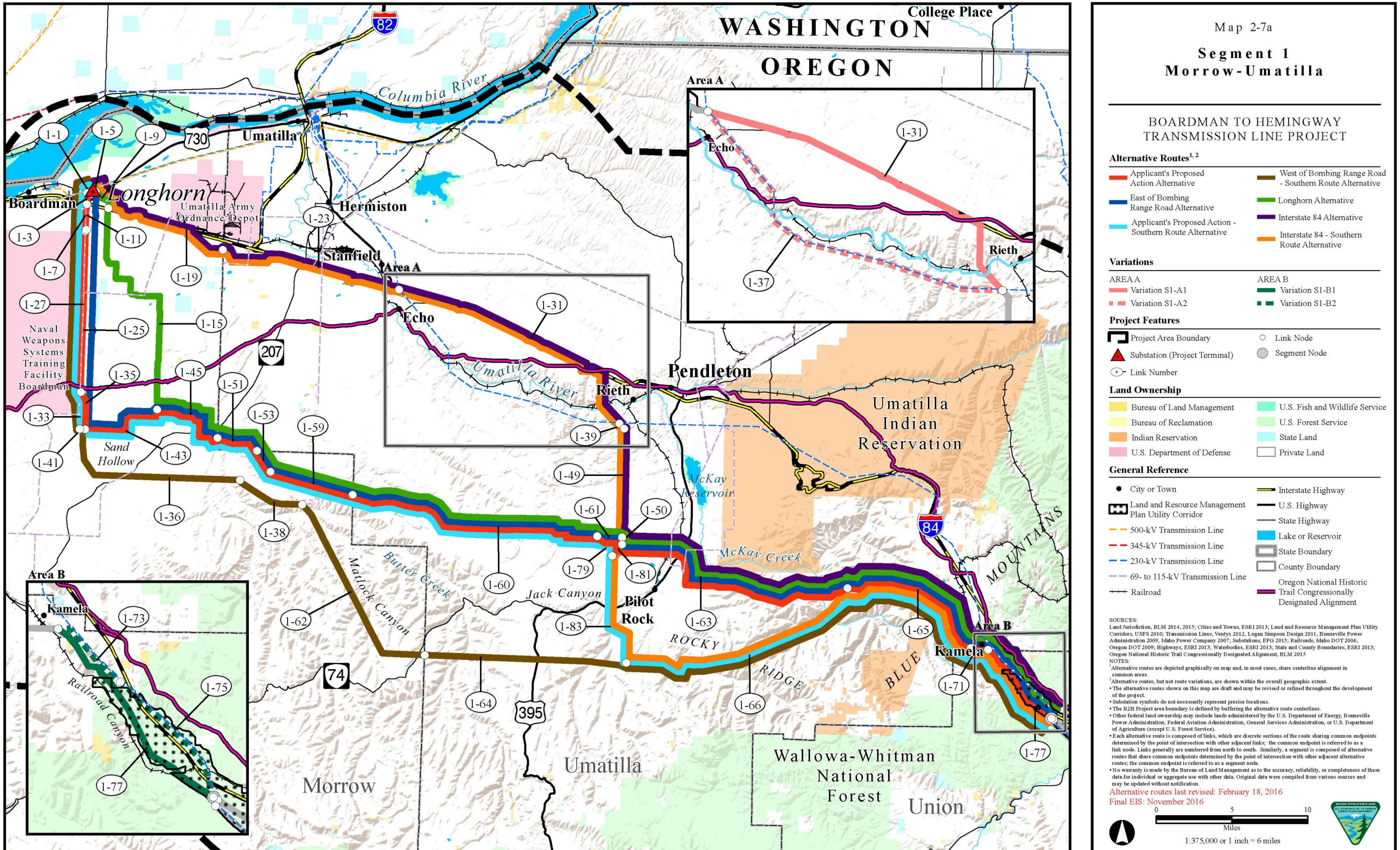




EAST OF BOMBING RANGE ROAD ALTERNATIVE (LONGHORN VARIATION IN DRAFT EIS) [LINKS 1-1, 1-3, 1-11, 1-25, 1-33, 1-41, 1-43, 1-45, 1-51, 1-53, 1-59, 1-60, 1-61, 1-50,1-63, 1-65, 1-71,1-77; 92.3 MILES]



The East of Bombing Range Road Alternative was addressed in the Draft EIS as the Longhorn Variation. It differs from the Applicant's Proposed Action Alternative only in that it parallels Bombing Range Road on the east side rather than on the west side of the road. The route was developed to address concerns (1) raised by the Navy regarding encroachment on military airspace in the vicinity of the NWSTF Boardman, (2) to minimize effects on tree farms and dairies in the area, and (3) to align with an existing transmission corridor.


Map 2-7a
Segment 1
Morrow-Umatilla
BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT
Alternative Routes[1, 2]
Applicant's Proposed Action Alternative
East of Bombing Range Road Alternative
Applicant's Proposed Action - Southern Route Alternative
West of Bombing Range Road - Southern Route Alternative
Longhorn Alternative
Interstate 84 Alternative
Interstate 84 - Southern Route Alternative
Variations
AREA A
Variation S1-A1
Variation S1-A2
AREA B
Variation S1-B1
Variation S1-B2
Project Features
Project Area Boundary
Substation (Project Terminal)
Link Number
Link Node
Segment Node
Land Ownership
Bureau of Land Management
Bureau of Reclamation
Indian Reservation
U.S. Department of Defense
U.S. Fish and Wildlife Service
U.S. Forest Service
State Land
Private Land
General Reference
City or Town
Land and Resource Management Plan Utility Corridor
500-kV Transmission Line
345-kV Transmission Line
230-kV Transmission Line
69- to 115-kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Lake or Reservoir
State Boundary
County Boundary
Oregon National Historic Trail Congressionally Designated Alignment
SOURCES:
Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Land and Resource Management Plan Utility Corridors, USFS 2010; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015
NOTES:
[1]Alternative routes are depicted graphically on map and, in most cases, share centerline alignment in common areas.
[2]Alternative routes, but not route variations, are shown within the overall geographic extent.
• The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
• Substation symbols do not necessarily represent precise locations.
• The B2H Project area boundary is defined by buffering the alternative route centerlines.
• Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
• Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
• No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
Alternative routes last revised: February 18, 2016
Final EIS: November 2016
0
5
10
Miles
1:375,000 or 1 inch = 6 miles
WASHINGTON
OREGON
College Place
Columbia River
Umatilla
Boardman
Longhorn
Umatilla Army Ordnance Depot
Hermiston
Stanfield
Echo
Rieth
Pendleton
Naval Weapons Systems Training Facility Boardman
Sand Hollow
Umatilla Indian Reservation
McKay Reservoir
McKay Creek
Umatilla River
Butter Creek
Matlock Canyon
Jack Canyon
Pilot Rock
ROCKY RIDGE
BLUE MOUNTAINS
Kamela
Railroad Canyon
Wallowa-Whitman National Forest
Morrow
Umatilla
Union
Area A
Area B
82
84
730
207
74
395
1-1
1-3
1-5
1-7
1-9
1-11
1-15
1-19
1-23
1-25
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1-62
1-63
1-64
1-65
1-66
1-71
1-73
1-75
1-77
1-79
1-81
1-83

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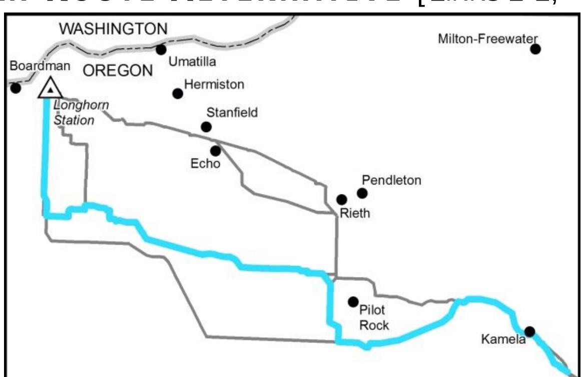
Although closer to the NWSTF Boardman property, the alternative route parallels the existing UEC 115-kV transmission line (located on the east side of Bombing Range Road) and the BPA 69-kV line (located on the west side of Bombing Range Road). The right-of-way along the northern portion of this alternative would be immediately adjacent to but would not extend over the eastern boundary of the NWSTF Boardman property.

The alternative route exits the planned Longhorn Substation to the southwest, where it immediately crosses over the Union Pacific Railroad, then turns south and crosses the intersection of Interstate 84 and U.S. Highway 730, where the transmission line would continue south along the east side of Bombing Range Road, crossing mostly private land and a parcel of state-administered land. The alternative route continues along the east side of Bombing Range Road for approximately 15 miles, along the edge of the Boardman Tree Farm and other irrigated agricultural lands, before turning to the east traversing areas of irrigated and dryland agriculture for approximately 40 miles north of Butter Creek and Jack Canyon. The transmission line would cross U.S. Highway 395 between the community of Pilot Rock and the McKay Creek National Wildlife Refuge before ascending the Blue Mountains, south of the Umatilla Indian Reservation, across McKay Creek and onto the Wallowa-Whitman National Forest. This alternative route does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice and continues to the southeast between the interstate and Blue Mountain Forest State Scenic Corridor in Railroad Canyon.

The East of Bombing Range Road Alternative would be designed using two structure types. From Longhorn Substation for about 3.0 miles, the transmission line structures typically would be 170-feet tall self-supported steel lattice with typical spans of approximately 1,500 feet between structures. From that point to the south, where the transmission line would be adjacent to the NWSTF Boardman, structures would be no taller than 100 feet tubular steel H-frame with typical spans of 500 to 700 feet between structures. Where the transmission line would no longer be adjacent to the NWSTF Boardman, the structure type would revert to 170-foot tall self-supported steel lattice.

APPLICANT'S PROPOSED ACTION – SOUTHERN ROUTE ALTERNATIVE [LINKS 1-1, 1-3, 1-7, 1-27, 1-35, 1-43, 1-45, 1-51, 1-53, 1-59, 1-60, 1-79,1-83, 1-66, 1-65, 1-71, 1-77; 99.1 MILES]

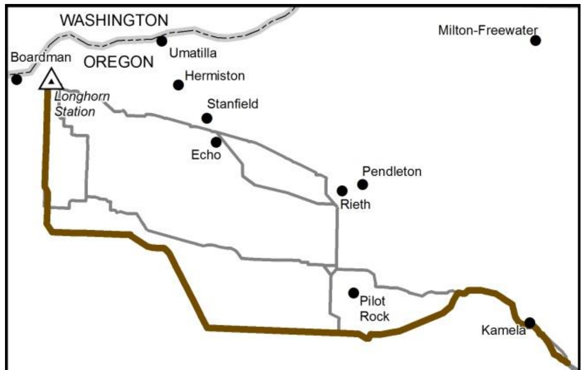


Applicant's Proposed Action - Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative was not addressed as such in the Draft EIS and is the result of incorporating a route-variation option recommended in comments since the Draft EIS was released for public review. It is the same as the Applicant's Proposed Action through Link 1-61 where it turns south. The north-south portion that passes to the west of Pilot Rock was proposed by the DNR of the CTUIR to connect with the southern route alternative proposed by Morrow and Umatilla counties.

The alternative route exits the planned Longhorn Substation to the south, crossing the intersection of Interstate 84 and U.S. Highway 730, where the transmission line would then cross to the west side of Bombing Range Road. The alternative route continues along the west side of Bombing Range Road for approximately 12 miles, within a 90-foot-wide use area, currently occupied by the BPA 69-kV transmission line, on the NWSTF Boardman, before crossing the road and turning to the east traversing areas of irrigated and dryland agriculture for approximately 40 miles north of Butter Creek and Jack Canyon. The transmission line would then turn south crossing U.S. Highway 395 about 4 miles west of Pilot Rock and continue to the south before turning toward the east and ascending the Blue Mountains across Rocky Ridge. This alternative route crosses McKay Creek and enters the Wallowa-Whitman National Forest. This alternative route does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice and continues to the southeast between the interstate and Blue Mountain Forest State Scenic Corridor in Railroad Canyon.

WEST OF BOMBING RANGE ROAD – SOUTHERN ROUTE ALTERNATIVE [LINKS 1-1, 1-3, 1-7, 1-27, 1-35, 1-36, 1-38, 1-62, 1-64, 1-66, 1-65, 1-71, 1-77; 95.6 MILES]

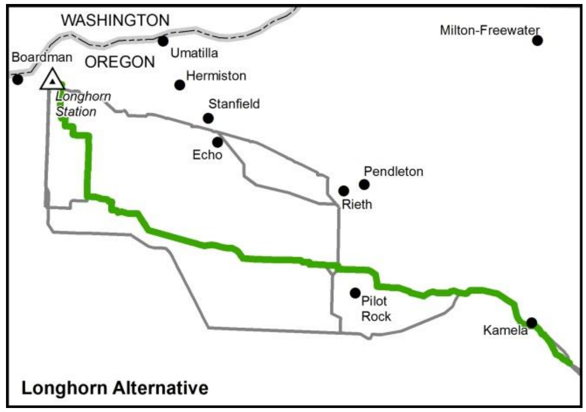


West of Bombing Range Road - Southern Route Alternative

The West of Bombing Range Road to Southern Route Alternative was not addressed in the Draft EIS and is the result of a route-variation option recommended in comments since the Draft EIS was released for public review. It was proposed by Morrow and Umatilla counties to avoid agricultural areas and areas of potential windfarm development. The north-south portion of the alternative route south of the Longhorn Substation is the same alignment as the Applicant's Proposed Action Alternative and the Applicant's Proposed Action – Southern Route Alternative.

It exits the planned Longhorn Substation to the south, crossing the intersection of Interstate 84 and U.S. Highway 730, where the transmission line would then cross to the west side of Bombing Range Road. The alternative route continues along the west side of Bombing Range Road for approximately 12 miles, within a 90-foot-wide use area, currently occupied by a 69-kV transmission line owned by BPA, on the NWSTF Boardman, before crossing the road and continuing an additional 5 miles to the south. Just west of Oregon Route 207, the transmission line would turn to the east traversing an area of dryland agriculture for 15 miles before crossing Butter Creek and turning to the southeast paralleling Matlock Canyon (the Umatilla south route-variation option recommended by Morrow County [Section 2.1.1.3]). This alternative route then continues to the east for approximately 25 miles crossing U.S. Highway 395 9 miles southwest of Pilot Rock and ascending the Blue Mountains across Rocky Ridge. This alternative route crosses McKay Creek and enters the Wallowa-Whitman National Forest. This alternative route does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice and continues to the southeast between the interstate and Blue Mountain Forest State Scenic Corridor in Railroad Canyon.

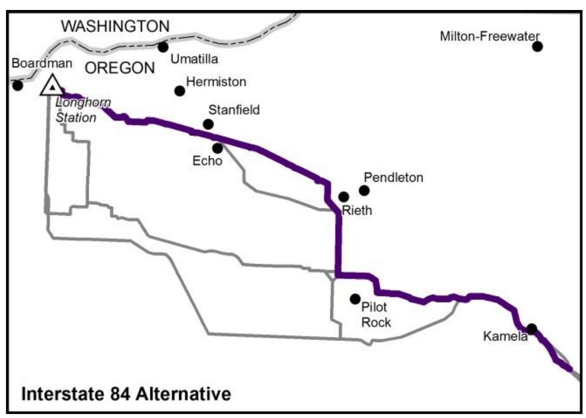
LONGHORN ALTERNATIVE [LINKS 1-5, 1-9, 1-15, 1-45, 1-51, 1-53, 1-59, 1-60, 1-61, 1-50, 1-63, 1-65, 1-71, 1-77; 88.2 MILES]



Longhorn Alternative

The Longhorn Alternative was addressed in the Draft EIS. Except for the initial north-south portion of the route Links 1-5, 1-9, 1-15, the Longhorn Alternative is the same as the Applicant's Proposed Action Alternative. The alternative route exits the planned Longhorn Substation to the east crossing U.S. Highway 730 before turning to the south across Interstate 84. This alternative route then continues to the southeast avoiding irrigated agricultural lands and the Boardman Tree Farm for approximately 8 miles, then the transmission line would turn to the south toward Sand Hollow before heading east to traverse areas of irrigated and dryland agriculture for approximately 35 miles north of Butter Creek and Jack Canyon. The transmission line would cross U.S. Highway 395 between the community of Pilot Rock and the McKay Creek National Wildlife Refuge before ascending the Blue Mountains, south of the Umatilla Indian Reservation, across McKay Creek and onto the Wallowa-Whitman National Forest. This alternative route does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice and continues to the southeast between the interstate and Blue Mountain Forest State Scenic Corridor in Railroad Canyon.

INTERSTATE 84 ALTERNATIVE [LINKS 1-5, 1-9, 1-19, 1-23, 1-31, 1-39, 1-49, 1-50, 1-63, 1-65, 1-71, 1-77; 84.7 MILES]



Interstate 84 Alternative

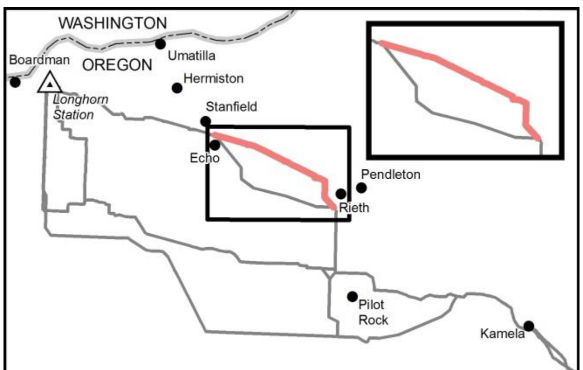
The Interstate 84 Alternative was not addressed in the Draft EIS and is the result of a route-variation option recommended in comments on the Draft EIS; comments received from Umatilla County; WildLands Defense; a letter from a consortium of the OCTA, Hells Canyon Preservation Council, Oregon Wild, and WildEarth Guardians; and several individuals. The intent was to consolidate the proposed transmission line with other linear facilities and in areas already disturbed.

The Interstate 84 Alternative exits the planned Longhorn Substation to the east crossing U.S. Highway 730 and then parallels Interstate 84 for approximately 35 miles (except for approximately a 6-mile-long section just south of the Umatilla Ordnance Depot) to an area 6 miles west of Pendleton. The alternative route then turns to the south crossing the Umatilla River before joining the alignment of the Applicant's Proposed Action Alternative northwest of Pilot Rock. The transmission line would cross U.S. Highway 395 between the community of Pilot Rock and the McKay Creek National Wildlife Refuge before ascending the Blue Mountains, south of the Umatilla Indian Reservation, across McKay Creek and onto the Wallowa-Whitman National Forest. This alternative route does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice and continues to the southeast between the interstate and Blue Mountain Forest State Scenic Corridor in Railroad Canyon.

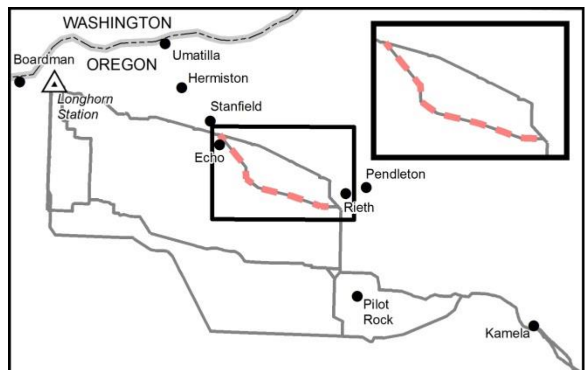
Variation S1 Area A (Parallel 230-kV Transmission Line)

Variation S1-A1 (Link 1-31; 18.5 miles) is the same alignment as the Interstate 84 and Interstate 84 to southern route alternative, paralleling Interstate 84 to the southeast for approximately 15 miles. About 6 miles west of Pendleton, the route turns to the south crossing the Umatilla River.

Variation S1-A2 (Link 1-37; 18.5 miles) was not addressed in the Draft EIS and was developed to respond to the comments on the Draft EIS to parallel Interstate 84 and/or the exiting 230-kV transmission line. This variation separates from the Interstate 84 and Interstate 84 – Southern Route alternatives by turning southeast in an area north of the community of Echo and parallels the existing 230-kV line crossing the Umatilla River approximately 15 miles west of Pendleton. The route continues to parallel the Umatilla River, about 1 mile to the south for another 9 miles before rejoining the Interstate 84 and Interstate 84 to Southern Route alternatives.

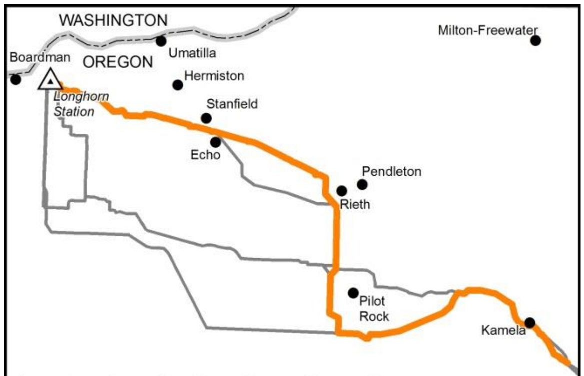


Variation S1-A1



Variation S1-A2

INTERSTATE 84 – SOUTHERN ROUTE ALTERNATIVE [LINKS 1-5, 1-9, 1-19, 1-23, 1-31, 1-39, 1-49, 1-50, 1-81, 1-83, 1-66, 1-65, 1-71, 1-77; 93.4 MILES]



Interstate 84 to Southern Route Alternative

The Interstate 84 – Southern Route Alternative was not addressed in the Draft EIS and is the result of a route-variation option recommended by the CTUIR DNR. The CTUIR DNR preferred routing along the Interstate 84 where there is existing disturbance, but suggested extending the north-south portion (Link 1-49) farther south to connect with the southern route, thereby avoiding a cultural landscape in the McKay Creek area.

The Interstate 84 – Southern Route Alternative exits the planned Longhorn Substation to the east crossing U.S. Highway 730 and then parallels Interstate 84 for approximately 35 miles, except for about 6 miles south of the Umatilla Ordnance Depot, to an area 6 miles west of Pendleton. The alternative route then turns to the south crossing the Umatilla River and Jack Canyon before joining the Southern Route southwest of Pilot Rock and ascending the Blue Mountains across Rocky Ridge. This alternative route then crosses McKay Creek and enters the Wallowa-Whitman National Forest. This alternative route does not parallel the existing 230-kV transmission line, starting south of Kamela, to avoid crossing Interstate 84 twice and continues to the southeast between the interstate and Blue Mountain Forest State Scenic Corridor in Railroad Canyon.

ADDITIONAL ACTION – 69-KV LINE RELOCATION

The current alignment of the BPA 69-kV transmission line is illustrated in Figure 2-22a. The existing 69-kV line exits the BPA-owned Boardman Substation north of Interstate 84 over to and south along the west side of Bombing Range Road to the southeast corner of the NWSTF Boardman, then traverses east to west along the southern boundary of the NWSTF Boardman property for approximately 2 miles, then turns southwest and continues on private land to the existing Ione Substation to serve the Columbia Basin Electric Cooperative load.

To allow the BPA to continue electrical service to customers serviced by the 69-kV line and accommodate the Applicant's requested use of the NWSTF Boardman property, the BPA and UEC, which owns and operates a 115-kV transmission line on private land on the east side of Bombing Range Road, are coordinating to develop options potentially to relocate BPA's 69-kV line. Three options are being considered. All three options involve replacing UEC's 115-kV line with double-circuit structures to support 230-kV lines. Design Option 1 provides for partial removal of the BPA 69-kV line from the NWSTF Boardman to allow the vacated area to be repurposed for the B2H 500-kV transmission line. Design Options 2 and 3 both provide for complete removal of the BPA 69-kV transmission line from the NWSTF Boardman. A description of each design option follows.

Design Option 1(partial removal of the 69-kV line from NWSTF Boardman)

Design Option 1, illustrated in Figures 2-22b and 2-22c, reflects partial removal (12.2 miles) of the 69-kV line from the NWSTF Boardman. Design Option 1 involves building approximately 12.2 miles of new double-circuit 230-kV line. From the intersection of Wilson Lane and Bombing Range Road to Homestead Lane (approximately 3.5 miles), where the line enters the Bombing Range Substation, the UEC 115-kV transmission line would be rebuilt as a tubular steel, single-pole, double-circuit 230-kV. The west circuit would be energized initially at 69-kV by connecting it to the existing BPA 69-kV line at the intersection of Wilson Lane and Bombing Range Road. The east circuit would be energized initially at 115-kV by connecting it to the remaining existing UEC 115-kV line at the corner of Wilson Lane and Bombing Range Road. From Homestead Lane, the new double-circuit 230-kV line would extend south on the east side of Bombing Range Road on private land supporting only the west circuit (69-kV).

At the point where the proposed B2H transmission line would divert from the NWSTF Boardman property east onto private property, the 69-kV circuit would cross to the west side of Bombing Range Road and connect with the existing 69-kV H-frame line and continue on the NWSTF Boardman for approximately 3.9 miles then onto private land continuing south to the Ione Substation to serve the Columbia Basin Electric Cooperative load.

The double-circuit 230-kV structures would be no taller than 100 feet. OPGW would be installed in the shield-wire position. Spans between structures would be approximately 400 to 600 feet. The tubular steel poles would be direct buried where possible, and installed on a drilled-pier concrete foundation where required. The typical footprint would be a circle about 3 feet in diameter where direct buried. Where a foundation is used, the footprint would be approximately 8 feet in diameter. The double-circuit line is anticipated to occupy a right-of-way 55 feet wide.

Design Option 2(full removal of the 69-kV line from NWSTF Boardman)

Design Option 2, illustrated on Figures 2-22d and 2-22e, reflects full removal of the 69-kV line from the NWSTF Boardman. Of the approximately 15.6 miles of 69-kV line to be removed, most of the line is on the NWSTF Boardman, the remainder is on private land. Similar to Design Option 1, from the intersection of Wilson Lane and Bombing Range Road to Homestead Lane (approximately 3.5 miles), where the line enters the Bombing Range Substation, the UEC 115-kV transmission line would be rebuilt as a tubular steel, single-pole, double-circuit 230-kV. The lines would be energized initially at 69-kV on the west side and 115-kV on the east side.

South of Homestead Lane, the new double-circuit transmission line structures, with only the west circuit (69-kV) installed, would be constructed continuing south along the east side of the NWSTF Boardman eastern boundary on private land to and around the southeast corner of the NWSTF Boardman. The new 69-kV circuit would connect at this point to the existing 69-kV line and continue south to the Ione Substation.

The new double-circuit 230-kV line would be approximately 17.7 miles long (5.5 miles north of Homestead Lane with both circuits installed and 12.2 miles south of Homestead). The double-circuit

230-kV structures would be no taller than 100 feet above ground level where height is restricted due to operations associated with the NWSTF Boardman. OPGW would be installed in the shield-wire position. Spans between structures would be approximately 400 to 600 feet. The tubular steel poles would be direct buried where possible, and installed on a drilled-pier concrete foundation where required. The typical footprint would be a circle about 3 feet in diameter where direct buried. Where a foundation is used, the footprint would be approximately 8 feet in diameter. The double-circuit line is anticipated to occupy a right-of-way 55 feet wide.

Design Option 3(full removal of the 69-kV line from NWSTF Boardman with step-down substation)

In the event that wind-energy development precedes construction of the B2H Project, Design Option 3 assumes that the new tubular steel, single-pole double-circuit 230-kV would be constructed by others (e.g., wind-energy developers). Design Option 3, illustrated in Figures 2-22f and 2-22g, would be similar as Design Option 2 with a deviation in the south; the line would remain on the east side of Bombing Range Road. Also, south of the NWSTF Boardman, where the new double-circuit 230-kV line would cross over the 69-kV line, a new step-down substation (from 230-kV to 69-kV) would be constructed on a new site on private land (Figure 2-22g). The pad for the substation would be constructed to cover an area of approximately 410 feet by 235 feet. A standard 7-foot-high chain link fence with three-strand barbed wire on top would be constructed around the substation. A prefabricated concrete control building approximately 12 feet by 30 feet would be installed. Power to the substation would be provided by a 69-kV distribution transformer with a direct-current battery bank to provide 8 hours of backup power in the event of an outage of the 230-kV line. An approximately 0.35-mile-long existing primitive road would be upgraded to provide access to the substation.

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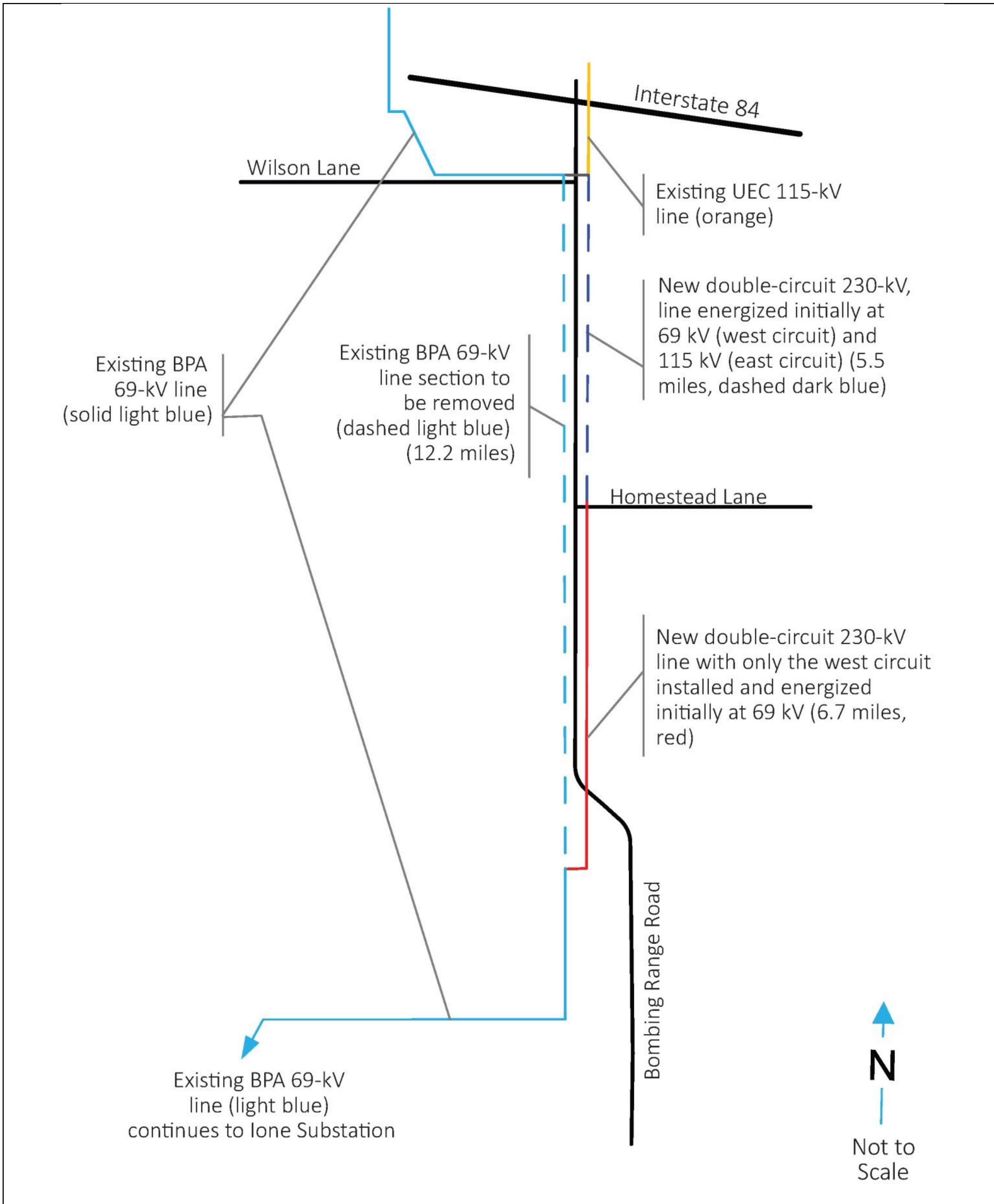


Figure 2-22b. Additional Action—Design Option 1 Removal and Rebuild

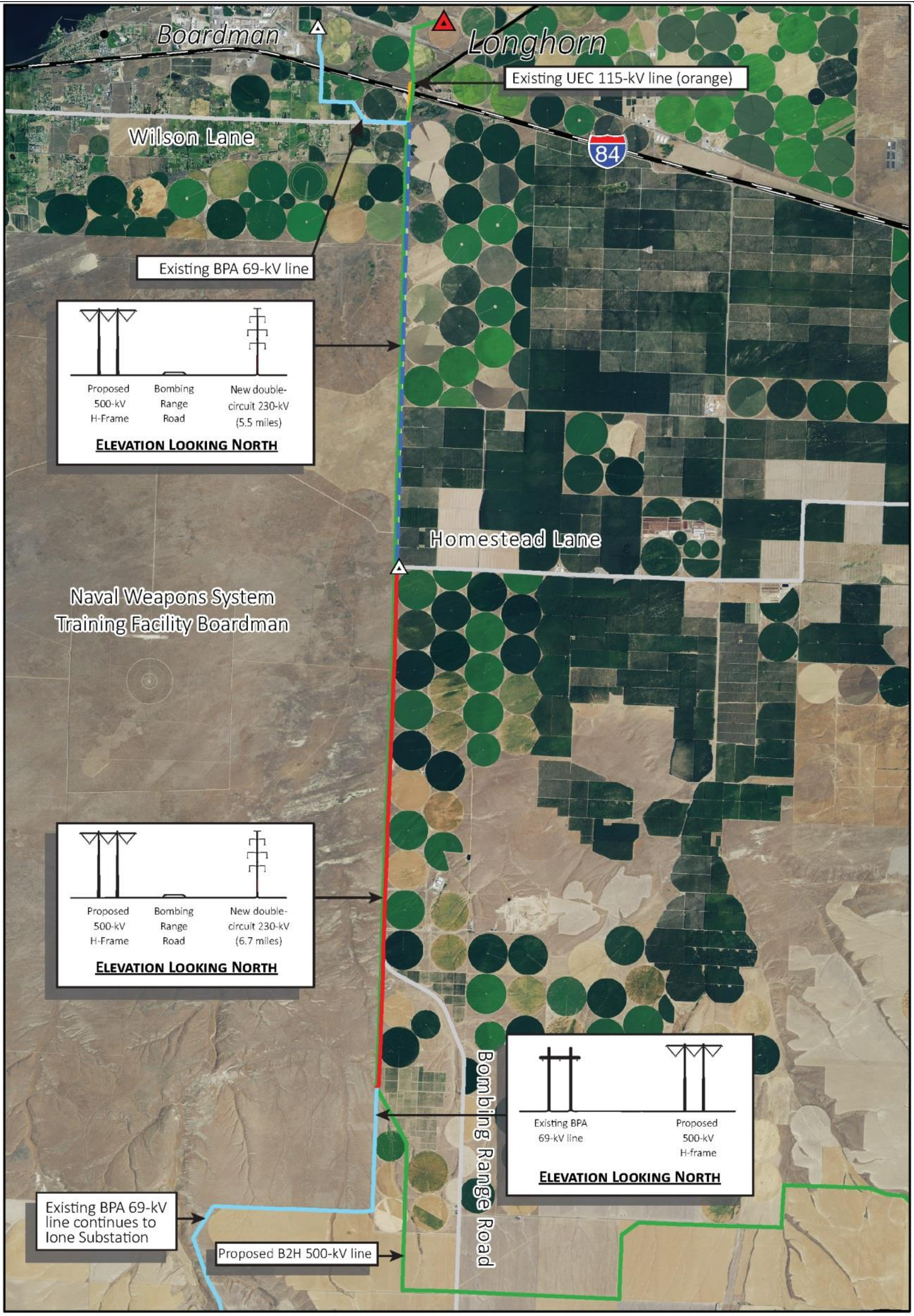


Figure 2-22c. Additional Action—Design Option 1 Proposed Configuration

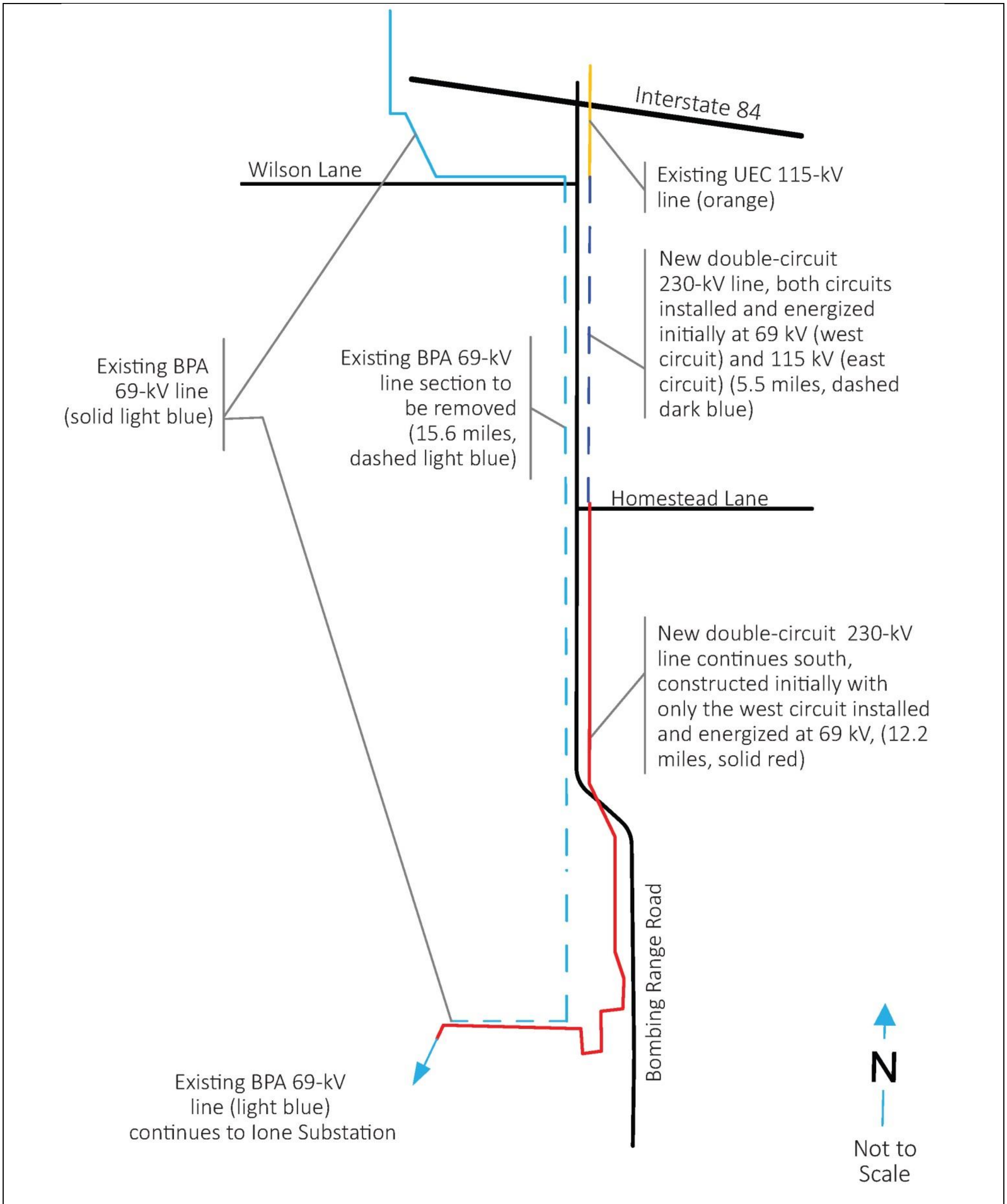


Figure 2-22d. Additional Action—Design Option 2 Removal and Rebuild

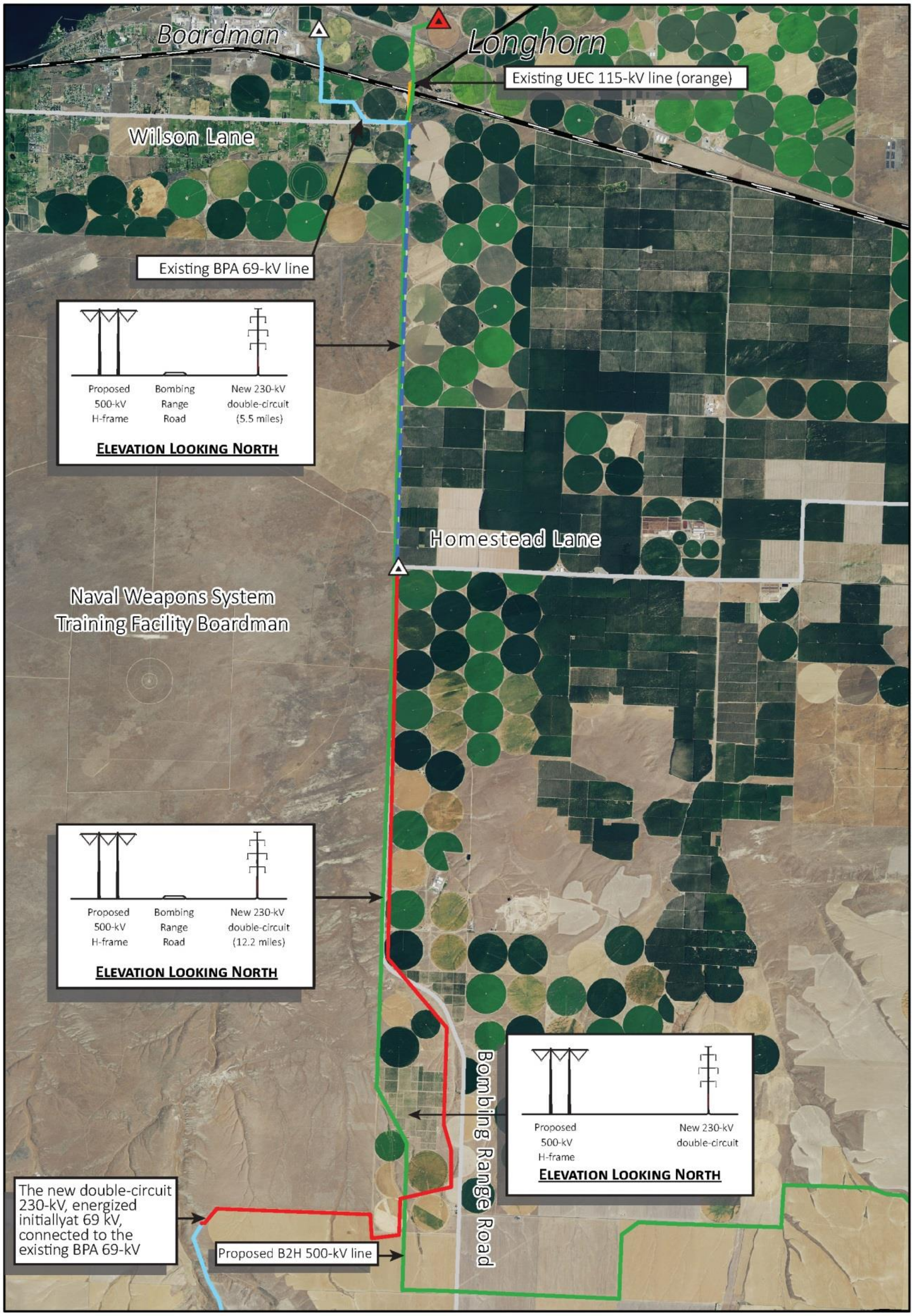


Figure 2-22e. Additional Action—Design Option 2 Proposed Configuration

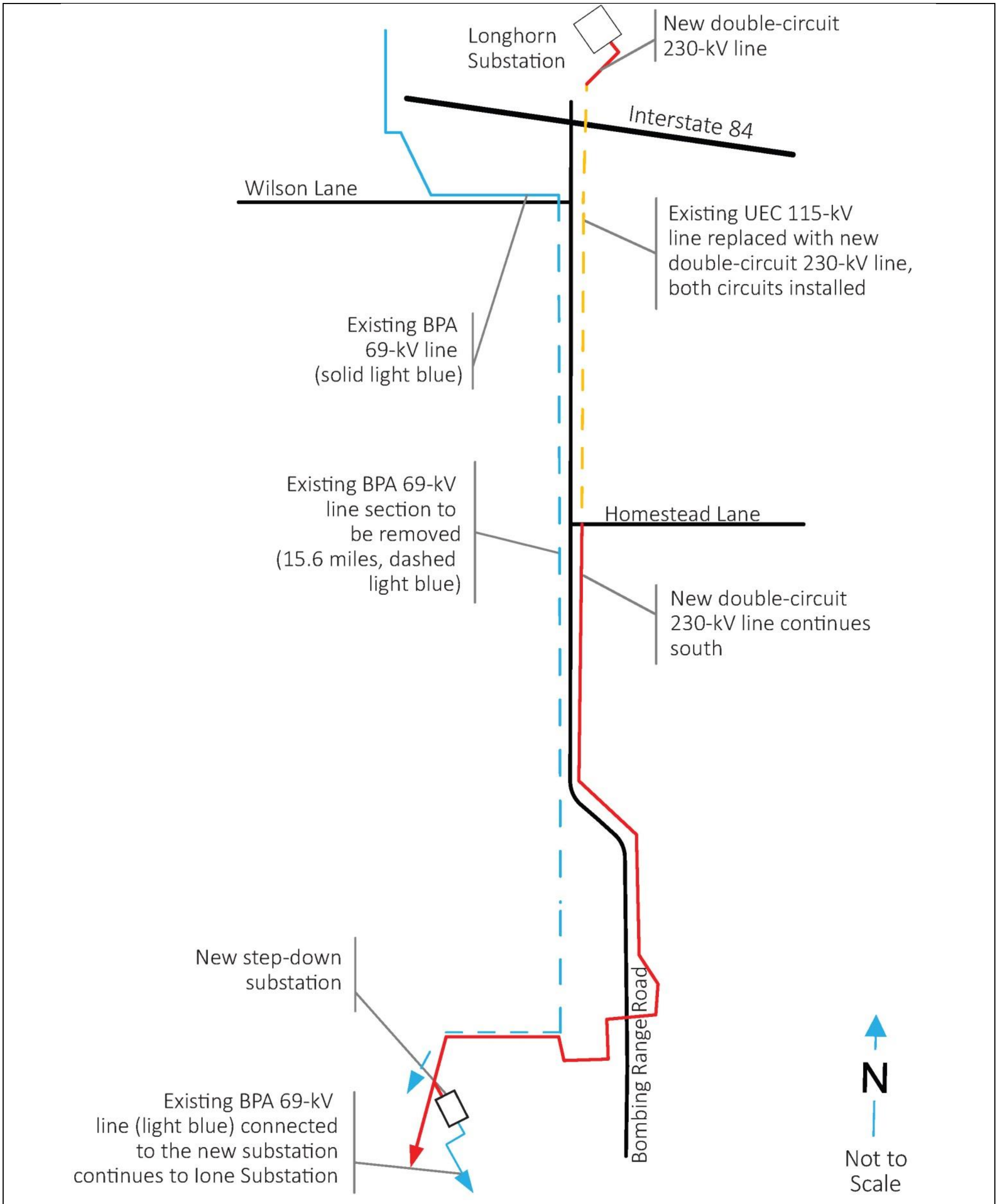


Figure 2-22f. Additional Action—Design Option 3 Removal and Rebuild

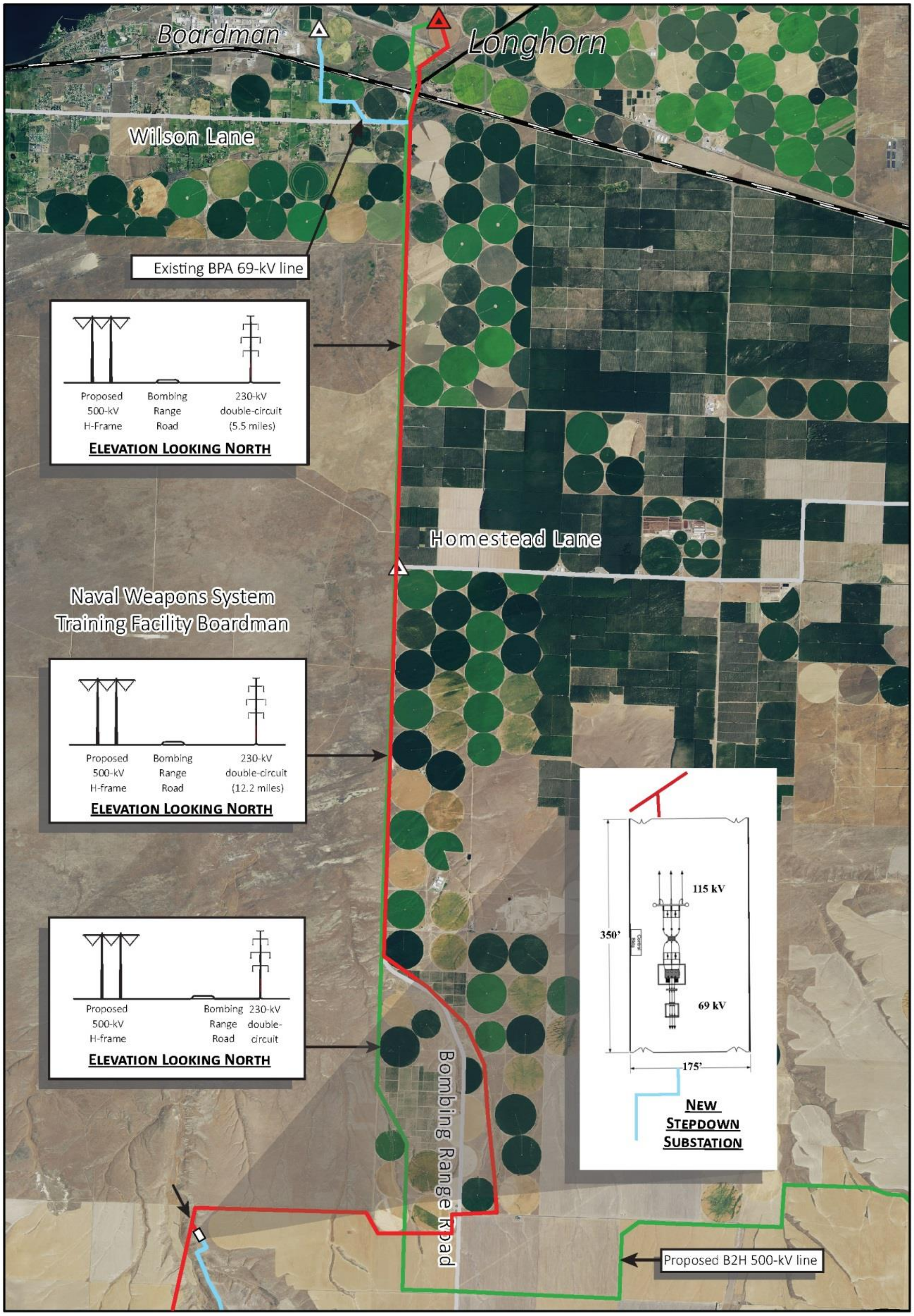


Figure 2-22g. Additional Action—Design Option 3 Proposed Configuration

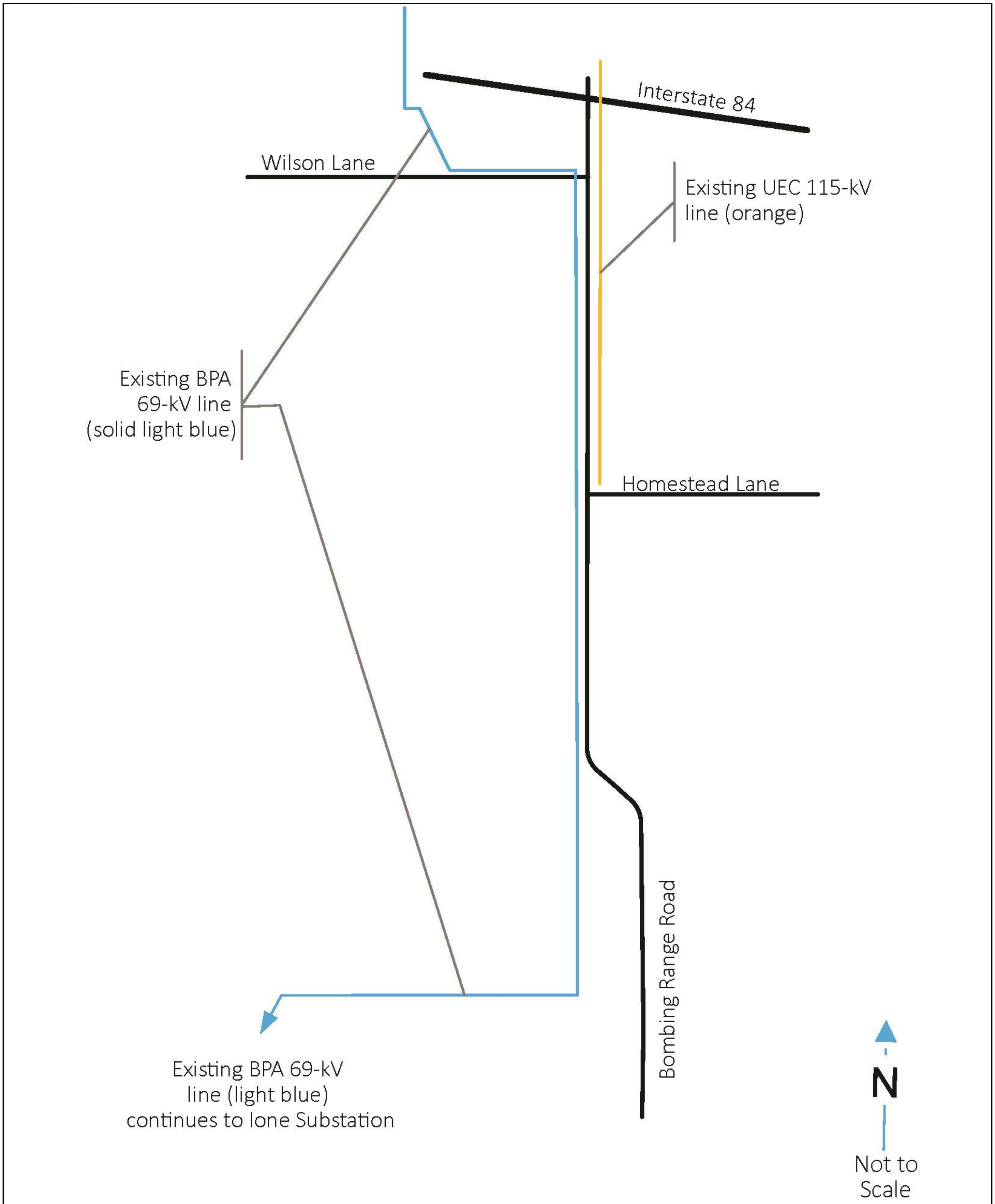
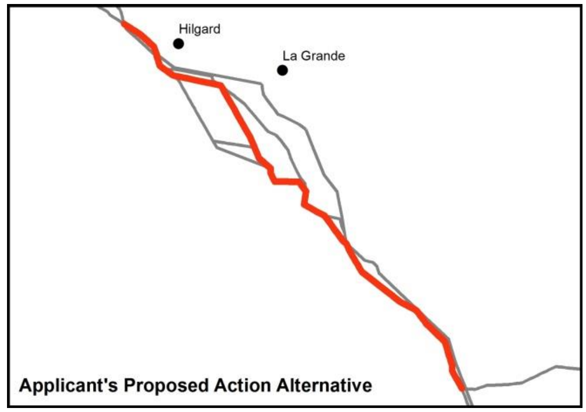


Figure 2-22a. Additional Action Existing Condition

2.5.2.2 Segment 2—Blue Mountains

Segment 2 begins at west of La Grande in Union County and ends east of North Powder in Union County. The three alternative routes and six areas of local route variations in Segment 2 are shown on Map 2-7b.

Applicant's Proposed Action Alternative [Links 2-1, 2-5, 2-15, 2-20, 2-30, 2-35, 2-45, 2-47, 2-50, 2-52, 2-60, 2-75, 2-85, 2-95; 33.8 miles]

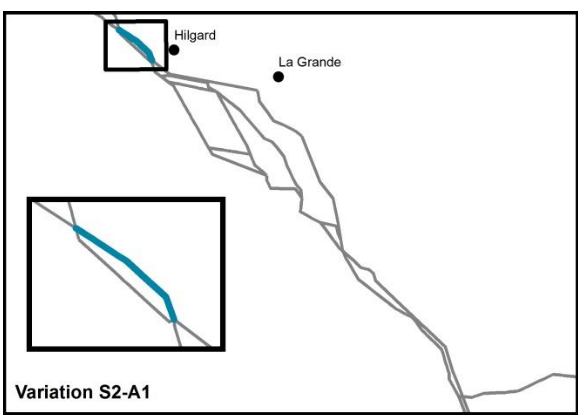


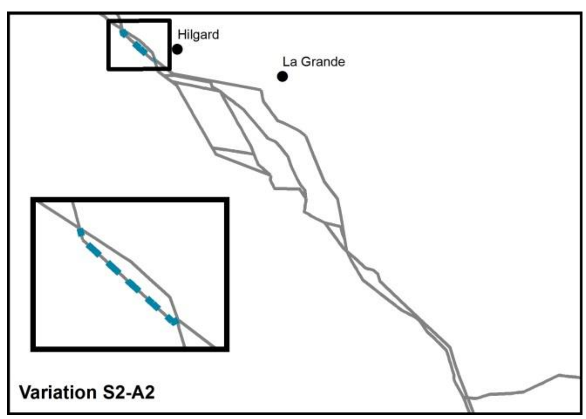
The Applicant's Proposed Action Alternative in Segment 2 was addressed in the Draft EIS and was the Agency Preferred Route in the Draft EIS. It was developed to the west of and to avoid the community of La Grande, Morgan Lake, and Ladd Marsh Wildlife Area. It continues from Segment 1 traveling to the southeast crossing Oregon Route 244, near Hilgard Junction State Park, and briefly heading east toward La Grande, for 3 miles, before again turning to the southeast. This alternative route is located 1 mile west of Morgan Lake and crosses Glass Hill and Ladd Creek as the route continues to the southeast for 15 miles before crossing Interstate 84 approximately 15 miles south of La Grande. Continuing to the southeast, the Applicant's Proposed Action Alternative crosses Powder River to the end of Segment 2 on Riverdale Hill.

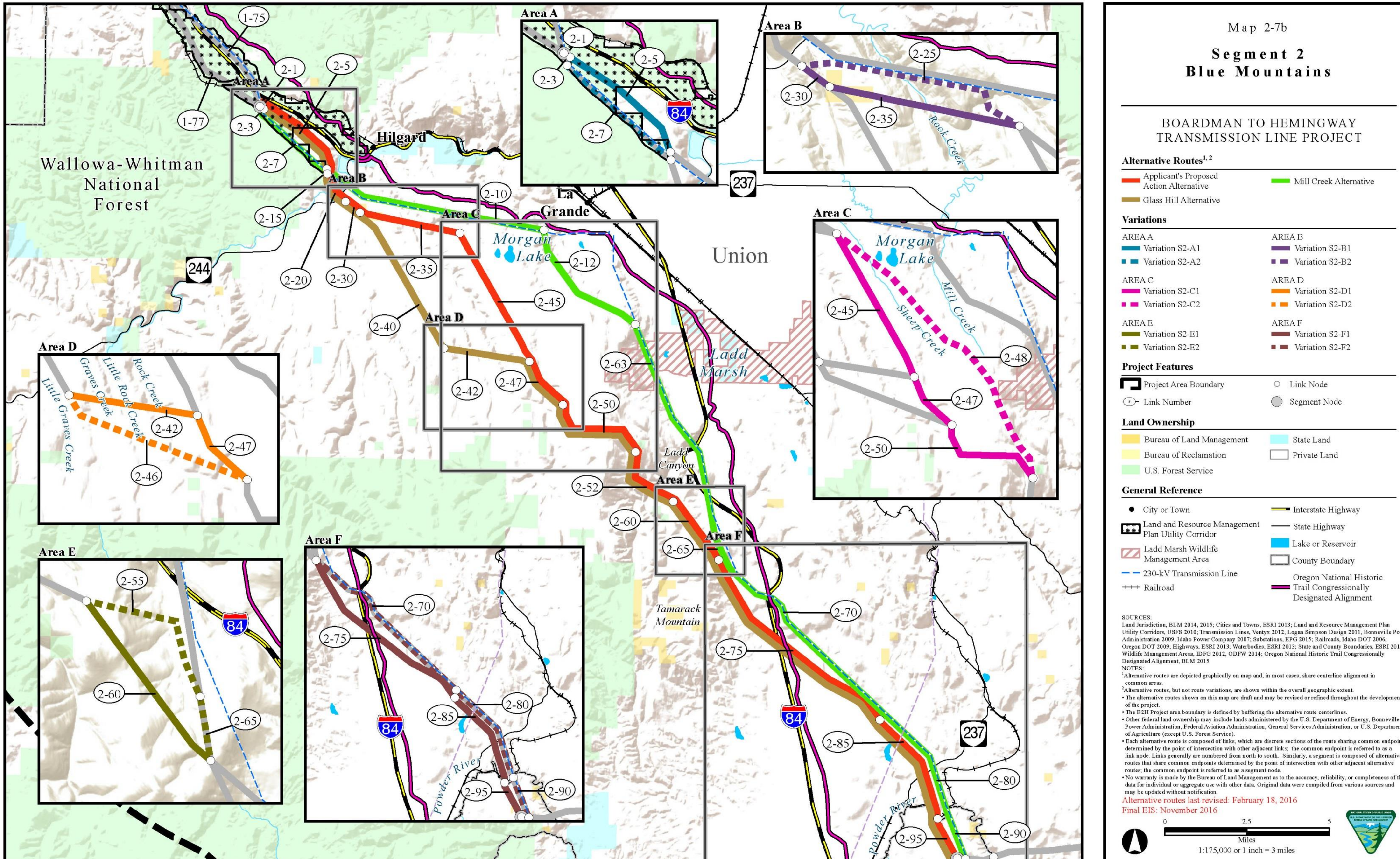
Variation S2 Area A (Wallowa-Whitman National Forest)

Variation S2-A1 (Links 2-1, 2-5; 2.8 miles) shares the same alignment as all of the alternatives in Segment 2, located 0.5 mile southeast of Interstate 84, paralleling the interstate for 3 miles to an area west of the Hilgard Junction State Park.

Variation S2-A2 (Links 2-3, 2-7; 2.9 miles) separates from the Segment 2 alternatives and parallels the existing 230-kV transmission line for 3 miles before rejoining the Segment 2 alternatives west of Hilgard Junction State Park.






Map 2-7b
Segment 2
Blue Mountains
BOARDMAN TO HEMINGWAY
TRANSMISSION LINE PROJECT
Alternative Routes[1, 2]
Applicant's Proposed Action Alternative
Mill Creek Alternative
Glass Hill Alternative
Variations
AREA A
Variation S2-A1
Variation S2-A2
AREA B
Variation S2-B1
Variation S2-B2
AREA C
Variation S2-C1
Variation S2-C2
AREA D
Variation S2-D1
Variation S2-D2
AREA E
Variation S2-E1
Variation S2-E2
AREA F
Variation S2-F1
Variation S2-F2
Project Features
Project Area Boundary
Link Node
Link Number
Segment Node
Land Ownership
Bureau of Land Management
State Land
Bureau of Reclamation
Private Land
U.S. Forest Service
General Reference
City or Town
Interstate Highway
Land and Resource Management Plan Utility Corridor
State Highway
Ladd Marsh Wildlife Management Area
Lake or Reservoir
County Boundary
230-kV Transmission Line
Railroad
Oregon National Historic Trail Congressionally Designated Alignment
SOURCES:
Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Land and Resource Management Plan Utility Corridors, USFS 2010; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013; Wildlife Management Areas, IDFG 2012, ODFW 2014; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015
NOTES:
[1]Alternative routes are depicted graphically on map and, in most cases, share centerline alignment in common areas.
[2]Alternative routes, but not route variations, are shown within the overall geographic extent.
• The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
• The B2H Project area boundary is defined by buffering the alternative route centerlines.
• Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
• Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
• No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
Alternative routes last revised: February 18, 2016
Final EIS: November 2016
0
2.5
5
Miles
1:175,000 or 1 inch = 3 miles
Wallowa-Whitman National Forest
Hilgard
La Grande
Union
Morgan Lake
Ladd Marsh
Ladd Canyon
Tamarack Mountain
Area A
Area B
Area C
Area D
Area E
Area F
Rock Creek
Sheep Creek
Mill Creek
Graves Creek
Little Rock Creek
Little Graves Creek
Powder River
84
237
244
1-75
1-77
2-1
2-3
2-5
2-7
2-10
2-12
2-15
2-20
2-25
2-30
2-35
2-40
2-42
2-45
2-46
2-47
2-48
2-50
2-52
2-55
2-60
2-63
2-65
2-70
2-75
2-80
2-85
2-90
2-95

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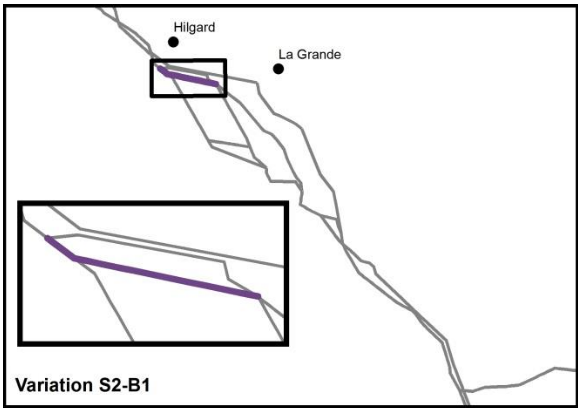
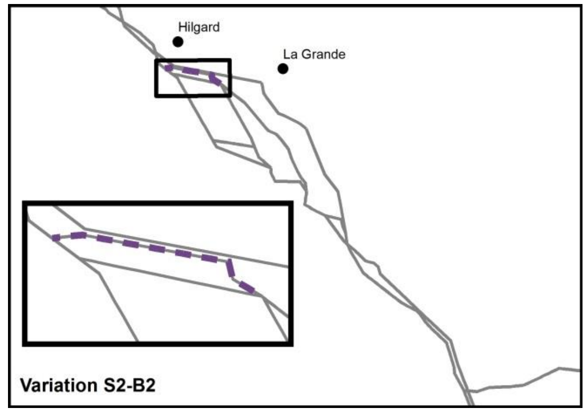
Variation S2 Area B (West of La Grande)

Variation S2-B1 (Links 2-30, 2-35; 3.7 miles) shares the same alignment as the Applicant's Proposed Action Alternative route beginning south of Oregon Route 244 and traveling to the east for approximately 3 miles, located a 0.5 mile south of the existing 230-kV transmission line, crossing Rock Creek.

Variation S2-B2 (Link 2-25; 3.8 miles) separates from the Applicant's Proposed Action Alternative route south of Oregon Route 244 and more closely parallels the existing 230-kV transmission line for 3 miles before rejoining the Applicant's Proposed Action Alternative east of Rock Creek.

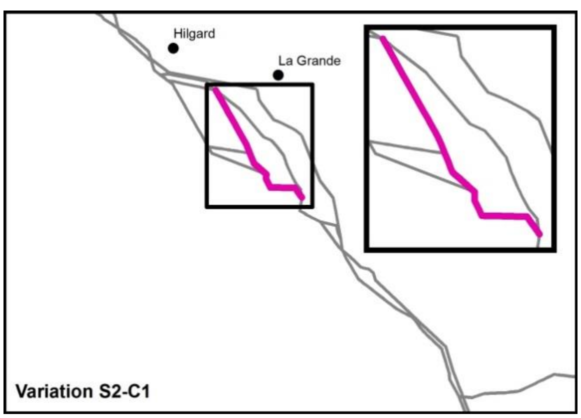


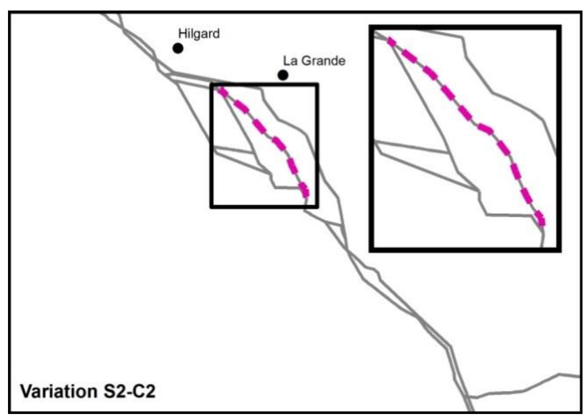


Variation S2 Area C (Elk Song Ranch Area)

Variation S2-C1 (Links 2-45, 2-47, 2-50; 9.3 miles) shares the same alignment as the Applicant's Proposed Action Alternative beginning 1.5 miles west of Morgan Lake heading to the southeast between Rock Creek and Sheep Creek for 7 miles, before turning to the east across Glass Hill to an area 1.5 miles northwest of Ladd Creek.

Variation S2-C2 (Link 2-48; 8.8 miles) separates from the Applicant's Proposed Action Alternative and would be located 0.25 mile from Morgan Lake and roughly paralleling Variation S2-C1 between Mill Creek and Sheep Creek, staying east of Glass Hill, to an area 1.5 miles northwest of Ladd Creek.

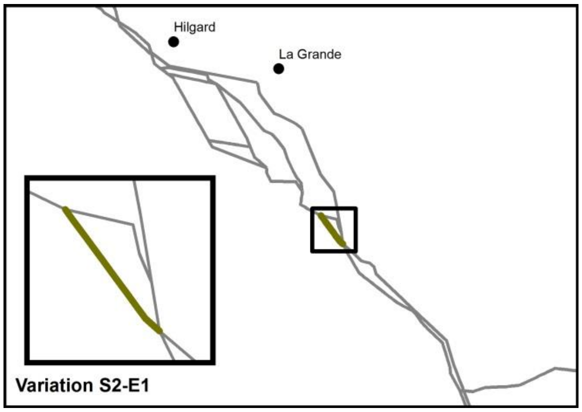


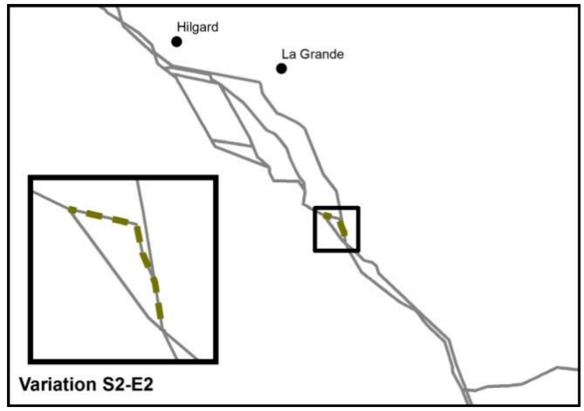


Variation S2 Area E

Variation S2-E1 (Link 2-60; 2.3 miles) shares the same alignment as the Applicant's Proposed Action Alternative and Glass Hill Alternative 0.5 mile southeast of Ladd Creek and continuing 2 miles to the southeast.

Variation S2-E2 (Links 2-55, 2-65; 2.6 miles**)** separates from the Applicant's Proposed Action Alternative and Glass Hill Alternative southeast of Ladd Creek and traverses down a steep slope toward Interstate 84 before traversing back up the northeast flank of Baldy to rejoin the Applicant's Proposed Action and Glass Hill alternatives.

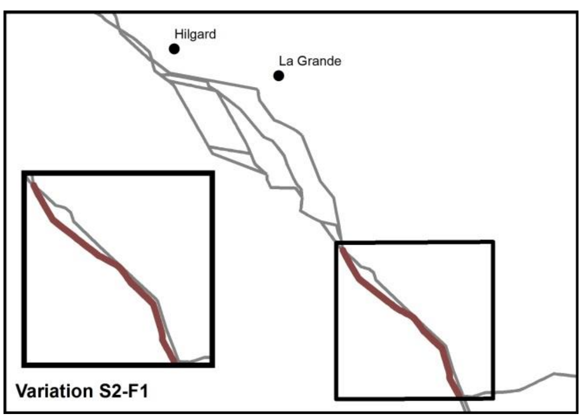


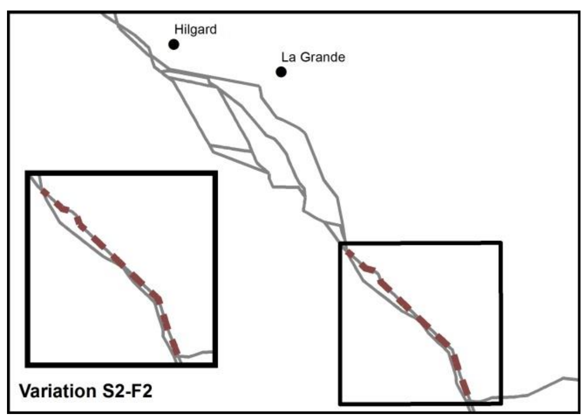


Variation S2 Area F

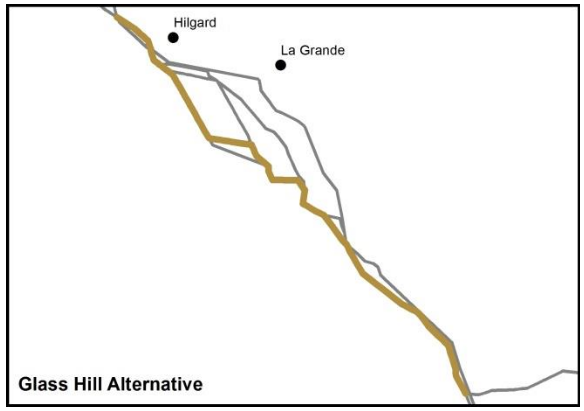
Variation S2-F1 (Links 2-75, 2-85, 2-95; 12.1 miles) shares the same alignment as all of the Segment 2 alternatives starting east of Baldy and traveling to the southeast for 12 miles crossing Interstate 84 and the Powder River to the end of Segment 2 on Riverdale Hill.

Variation S2-F2 (Links 2-70, 2-80, 2-90; 12.2 miles) separates from the Segment 2 alternatives east of Baldy and parallels an existing 230-kV transmission line for 12 miles crossing Interstate 84 and the Powder River to the end of Segment 2 on Riverdale Hill.





GLASS HILL ALTERNATIVE [LINKS 2-1, 2-5, 2-15, 2-20, 2-30, 2-40, 2-42, 2-47, 2-50, 2-52, 2-60, 2-75, 2-85, 2-95; 33.7 MILES]



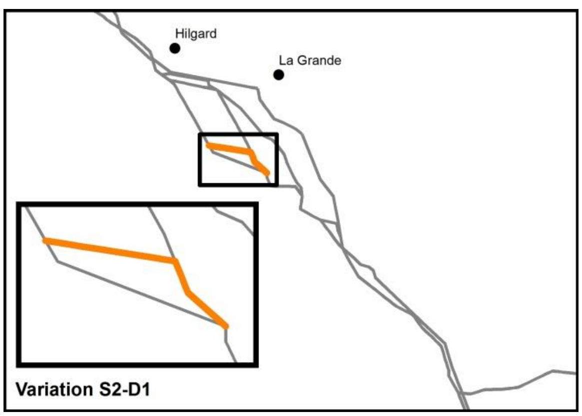
The Glass Hill Alternative was addressed in the Draft EIS. The alternative route was developed in response to various considerations of landowners, environmental resources, visual effects, and constructability expressed during the Community Advisory Process (Idaho Power Company 2012: 10-15) and scoping for the NEPA process to address concerns regarding proximity of the Applicant's Proposed Action Alternative to Ladd Marsh Wildlife Area and concerns about the visibility of the transmission line from La Grande in Union County.

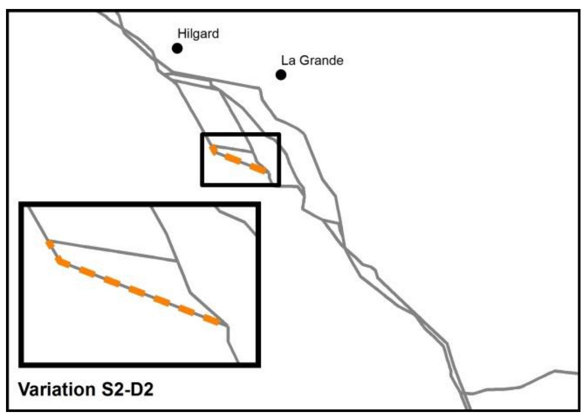
The alternative route continues from Segment 1 traveling to the southeast crossing Oregon Route 244, near Hilgard Junction State Park, separating from the Applicant's Proposed Action Alternative by continuing southeast adjacent to Little Graves Creek located 3 miles west of Morgan Lake, before turning to the east to rejoin the Applicant's Proposed Action Alternative 5 miles southwest of La Grande. The transmission line then would continue to the southeast for 11 miles before crossing Interstate 84 approximately 15 miles south of La Grande. Continuing to the southeast, the Glass Hill Alternative crosses Powder River to the end of Segment 2 on Riverdale Hill.

VARIATION S2 AREA D

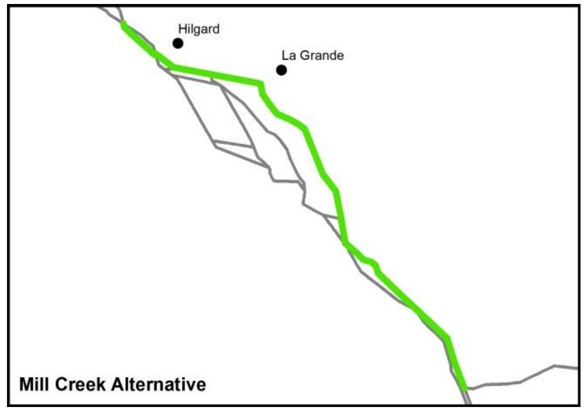
Variation S2-D1 (Links 2-42, 2-47; 4.3 miles) shares the same alignment as the Glass Hill Alternative starting at Little Graves Creek and crossing Graves Creek, Little Rock Creek, and Rock Creek as this route travels to the southeast toward Glass Hill.

Variation S2-D2 (Link 2-46; 4.1 miles) was recommended as part of comments on the Draft EIS, the intent of which was to help blend the transmission line structures into the surrounding landscape better and to avoid an elk population. Variation S2-D2 separates from the Glass Hill Alternative and roughly parallels Variation S2-D1 across Graves Creek, Little Rock Creek, and Rock Creek but located 0.75 mile farther to the south.





MILL CREEK ALTERNATIVE [LINKS 2-3, 2-7, 2-10, 2-12, 2-63, 2-65, 2-70, 2-80, 2-90; 34.0 MILES]

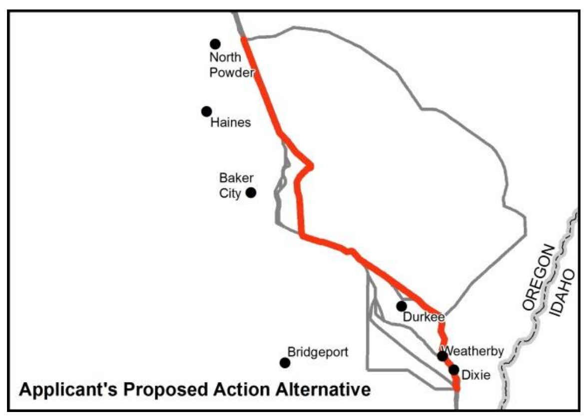


The Mill Creek Alternative was not addressed in the Draft EIS and is the result of a route-variation option recommended by Union County to parallel the existing 230-kV transmission line except in the general area of La Grande. The Mill Creek Alternative continues from Segment 1 traveling to the southeast where this alternative separates from the Applicant's Proposed Action Alternative, near Hilgard Junction State Park, crossing Oregon Route 244 parallel to the existing 230-kV transmission line toward La Grande to the east. The transmission line would follow the existing 230-kV transmission line until Table Mountain where this alternative route avoids closely approaching La Grande, and residences south of town, by turning to the south and would be located 1 mile east of Morgan Lake. Approximately 4 miles south of La Grande, this alternative route again parallels the existing 230-kV transmission line crossing the Ladd Marsh Wildlife Area and then Intestate 84 twice in Ladd Canyon before rejoining the Applicant's Proposed Action Alternative 12 miles south of La Grande. Continuing to the southeast, the Mill Creek Alternative crosses Powder River to the end of Segment 2 on Riverdale Hill.

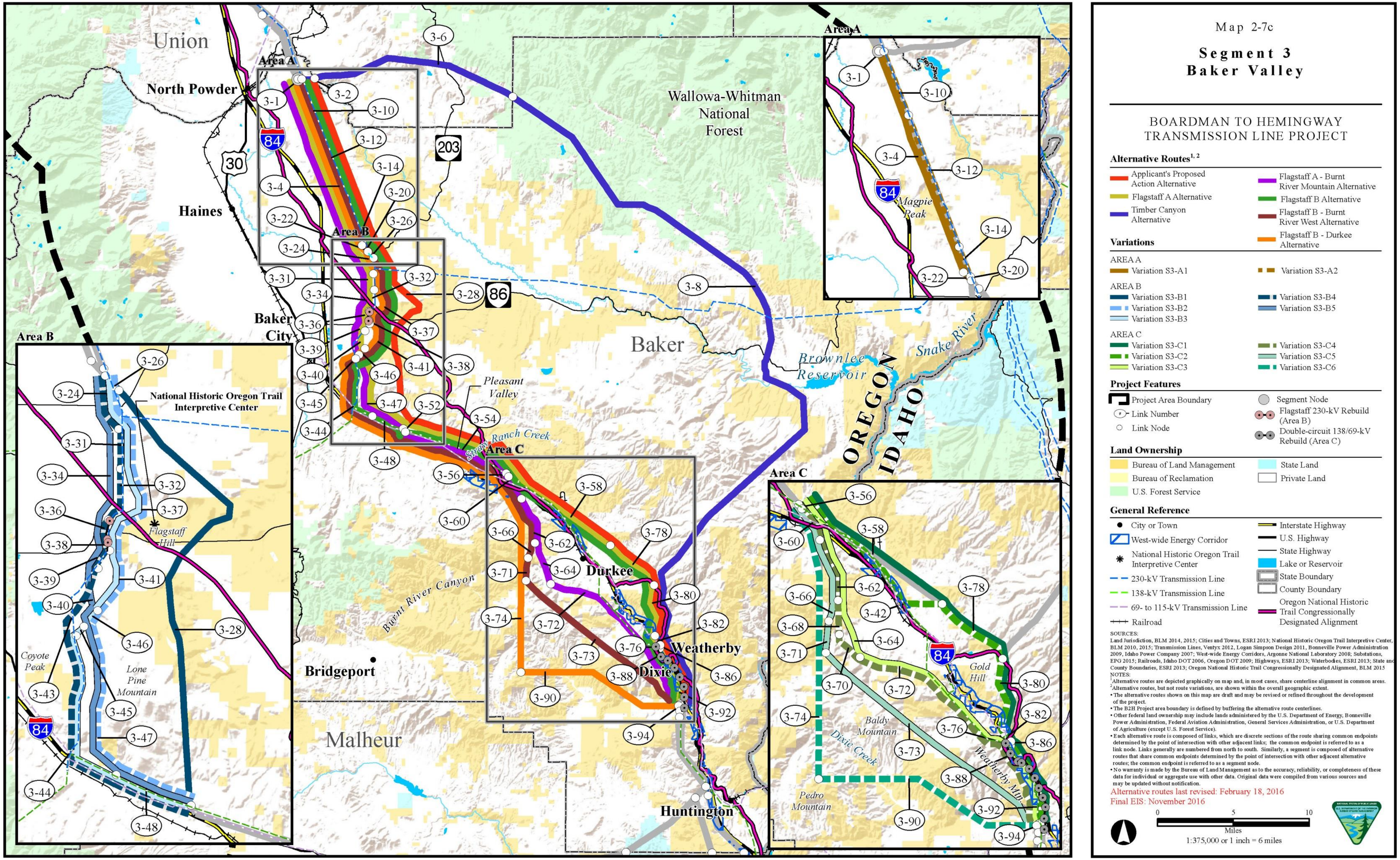
2.5.2.3 SEGMENT 3—BAKER VALLEY

Segment 3 begins at a point east of North Powder in Union County and ends at a point just south of Dixie in Baker County. The three alternative routes and three areas of local route variations in Segment 3 are shown on Map 2-7c.

APPLICANT'S PROPOSED ACTION ALTERNATIVE [LINKS 3-4, 3-22, 3-26, 3-28, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92; 55.2 MILES]



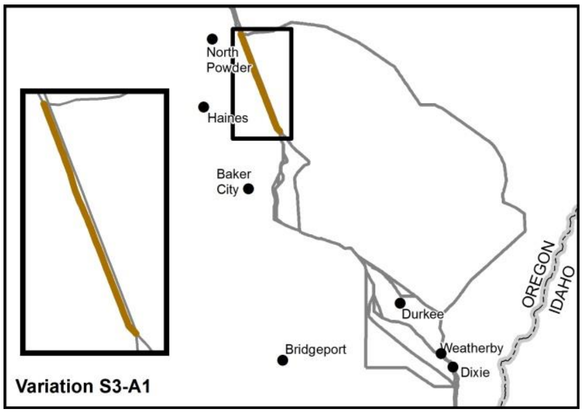
The Applicant's Proposed Action Alternative in Segment 3 was addressed in the Draft EIS. It begins on Riverdale Hill paralleling an existing 230-kV transmission line to the southeast passing to the east of Magpie Peak and then turning east of Flagstaff Hill to pass to the east of the NHOTIC and 5 miles east of Baker City. After crossing Oregon Route 86, the alternative travels south to Interstate 84, to the east of Lone Pine Mountain, where the transmission line would roughly parallel the interstate on the north side for approximately 28 miles except near the community of Durkee and Gold Hill. In this area, the Applicant's Proposed Action Alternative is located 1.5 miles to the northeast of Interstate 84 before paralleling the interstate between the communities of Weatherby and Dixie to the end of Segment 3 at Dixie Creek.

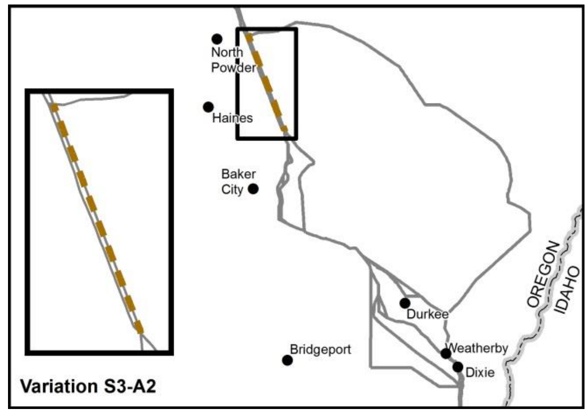

Map 2-7c
Segment 3
Baker Valley
BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT
Alternative Routes[1, 2]
Applicant's Proposed Action Alternative
Flagstaff A Alternative
Timber Canyon Alternative
Flagstaff A - Burnt River Mountain Alternative
Flagstaff B Alternative
Flagstaff B - Burnt River West Alternative
Flagstaff B - Durkee Alternative
Variations
AREA A
Variation S3-A1
Variation S3-A2
AREA B
Variation S3-B1
Variation S3-B2
Variation S3-B3
Variation S3-B4
Variation S3-B5
AREA C
Variation S3-C1
Variation S3-C2
Variation S3-C3
Variation S3-C4
Variation S3-C5
Variation S3-C6
Project Features
Project Area Boundary
Link Number
Link Node
Segment Node
Flagstaff 230-kV Rebuild (Area B)
Double-circuit 138/69-kV Rebuild (Area C)
Land Ownership
Bureau of Land Management
Bureau of Reclamation
U.S. Forest Service
State Land
Private Land
General Reference
City or Town
West-wide Energy Corridor
National Historic Oregon Trail Interpretive Center
230-kV Transmission Line
138-kV Transmission Line
69- to 115-kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Lake or Reservoir
State Boundary
County Boundary
Oregon National Historic Trail Congressionally Designated Alignment
SOURCES:
Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; National Historic Oregon Trail Interpretive Center, BLM 2010, 2015; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; West-wide Energy Corridors, Argonne National Laboratory 2008; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015
NOTES:
[1]Alternative routes are depicted graphically on map and, in most cases, share centerline alignment in common areas.
[2]Alternative routes, but not route variations, are shown within the overall geographic extent.
• The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
• The B2H Project area boundary is defined by buffering the alternative route centerlines.
• Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
• Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
• No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
Alternative routes last revised: February 18, 2016
Final EIS: November 2016
0 5 10
Miles
1:375,000 or 1 inch = 6 miles
Union
North Powder
Haines
Baker City
Baker
Malheur
Bridgeport
Durkee
Weatherby
Dixie
Huntington
Wallowa-Whitman National Forest
Pleasant Valley
Straw Ranch Creek
Burnt River Canyon
Brownlee Reservoir
Snake River
OREGON
IDAHO
Area A
Area B
Area C
National Historic Oregon Trail Interpretive Center
Flagstaff Hill
Coyote Peak
Lone Pine Mountain
Magpie Peak
Gold Hill
Baldy Mountain
Dixie Creek
Weatherby Mtn
Pedro Mountain
84
30
203
86

Variation S3 Area A

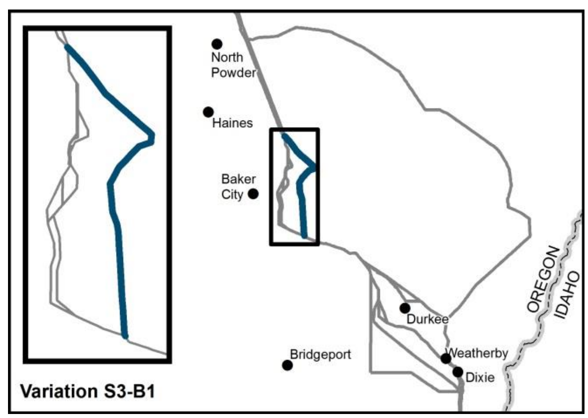
Variation S3-A1 (Links 3-4, 3-22; 12.4 miles) shares the same alignment as the Applicant's Proposed Action Alternative beginning on Riverdale Hill where it parallels an existing 230-kV transmission line for approximately 12 miles to the southeast passing to the east of Magpie Peak before ending approximately 1 mile north of Oregon Route 203.

Variation S3-A2 (Links 3-10, 3-12, 3-14, 3-20; 12.2 miles) was not addressed in the Draft EIS and is a route-variation option developed as a result of the BLM's request to colocate the proposed transmission line closer to the existing transmission line. This variation begins on Riverdale Hill paralleling an existing 230-kV (offset approximately 250-feet to the west) for approximately 12 miles to the southeast passing to the east of Magpie Peak before ending approximately 1 mile north of Oregon Route 203.





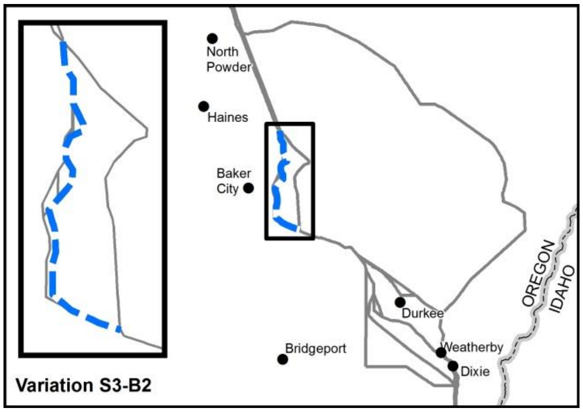
Variation S3 Area B

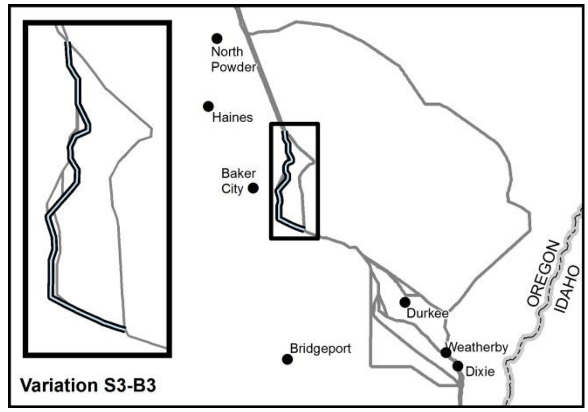


Variation S3-B1 (Links 3-26, 3-28; 13.9 miles) begins 1 mile north of Oregon Route 203 and is a part of the alignment of the Applicant's Proposed Action Alternative ending just north of an existing 138-kV transmission line and Interstate 84.

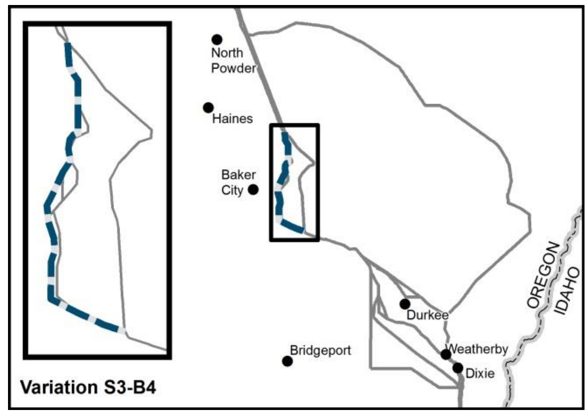
Variation S3-B2 (Links 3-24, 3-31, 3-37, 3-41, 4-46, 3-47, 3-48; 14.4 miles) begins 1 mile north of Oregon Route 203 and shares the same alignment as the Flagstaff B Alternative for approximately 8 miles before heading southeast following the Flagstaff A Alternative (Flagstaff Alternative from the Draft EIS) for approximately 4 miles. It then rejoins the Flagstaff B Alternative heading southeast for approximately 2 miles before ending just north of an existing 138-kV transmission line and Interstate 84.

Variation S3-B3 (Links 3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48; 14.7 miles) begins 1 mile north of Oregon Route 203 and shares the same alignment as the Flagstaff B Alternative before ending just north of an existing 138-kV transmission line and Interstate 84.

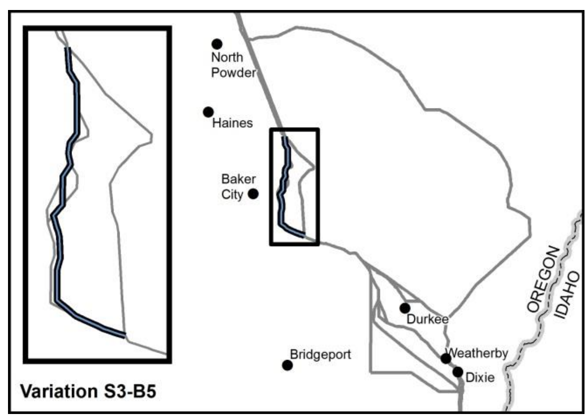




Variation S3-B4 (Links 3-24, 3-31, 3-32, 3-36, 3-38, 3-39, 3-43, 3-44, 3-48; 14.3 miles) begins 1 mile north of Oregon Route 203 and shares the same alignment as the Flagstaff A and B alternatives for approximately 1.5 miles. It then briefing heads southeast to parallel (250-feet offset to west) the existing 230-kV transmission line for approximately 2.6 miles. It then joins the alignment of the Flagstaff A Alternative in the vicinity of Oregon Route 86. It then leaves the Flagstaff A Alternative and heads southwest, roughly parallel to the existing 230-kV transmission line, before joining the Flagstaff B Alternative route, approximately 1.3 miles east of Coyote Peak. The variation follows the same alignment of the Flagstaff B Alternative for approximately 6.0 miles, ending just north of an existing 138-kV transmission line and Interstate 84.



Variation S3-B5 (Links 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48; 14.0 miles) begins 1 mile north of Oregon Route 203 and shares the same alignment as the Flagstaff A Alternative before ending just north of an existing 138-kV transmission line and Interstate 84.

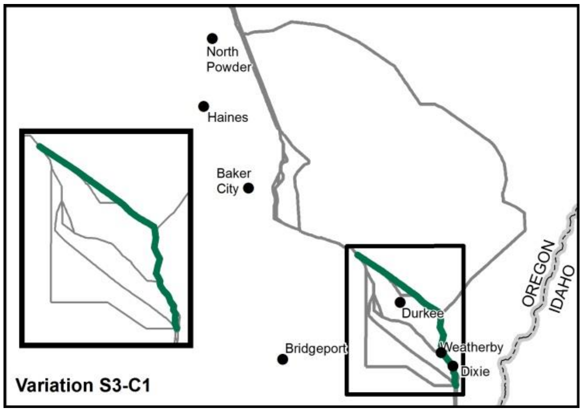


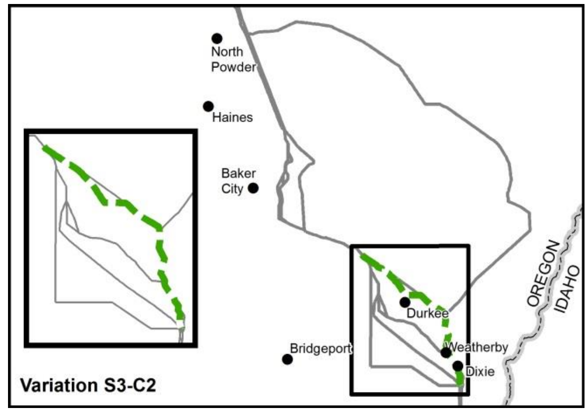
VARIATION S3 AREA C

Variation S3-C1 (Links 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92; 21.1 miles) is part of the Applicant's Proposed Action Alternative beginning just east of Straw Ranch Creek and approximately 0.8 mile north of Interstate 84 and ending at Dixie Creek.

Variation S3-C2 (Links 3-56, 3-42, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92; 21.7 miles) begins just east of Straw Ranch Creek, approximately 0.8 mile north of Interstate 84 and an existing 138-kV transmission line. The variation heads southeast for 0.3 mile, crossing the existing 138-kV transmission line, and then continues parallel to the existing 138-kV transmission line (on south side) for approximately 4.8

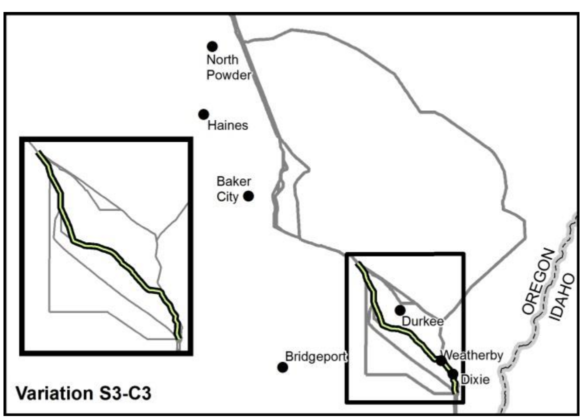
miles. Approximately 0.1 mile south of Hindman Road, the variation heads east for 0.1 mile crossing a railroad and the existing 138-kV transmission line again before heading southeast parallel to the existing 138-kV transmission line (on north side) for approximately 1.9 miles. The variation then heads directly east for 1.7 miles, crossing Durkee Creek approximately 0.7 mile north of Durkee, where it then joins the alignment of the Applicant's Proposed Action Alternative for 12.8 miles before ending at Dixie Creek.

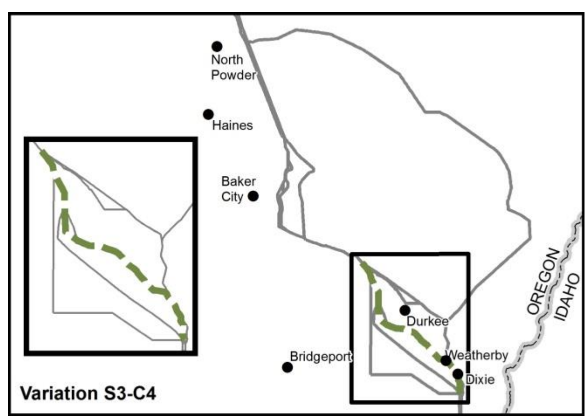




Variation S3-C3 (Links 3-56, 3-60, 3-62, 3-64, 3-72, 3-76, 3-88, 3-92; 21.1 miles) begins just east of Straw Ranch Creek and north of the existing 138-kV transmission line, approximately 0.8 mile north of Interstate 84, and north of the existing 138-kV transmission line. This variation follows the alignment of the Flagstaff A – Burnt River Mountain Alternative, which was addressed in the Draft EIS and intended to avoid Greater Sage-Grouse PHMA and the community of Durkee. The variation turns more to the south crossing Intestate 84 and then Burnt River Canyon, located 2.5 miles west of Durkee, before crossing Interstate 84 again near Weatherby. The variation then parallels the interstate for approximately 4 miles to the end of Segment 3 at Dixie Creek.

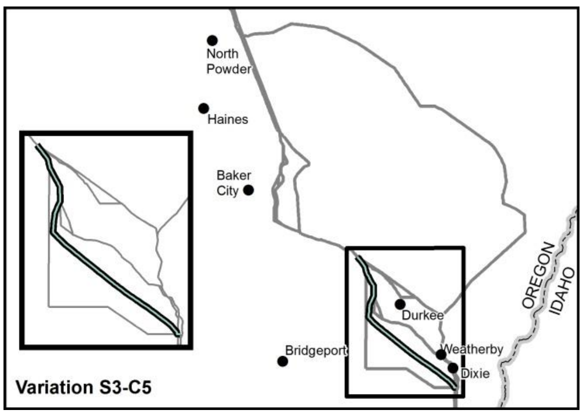
Variation S3-C4 (Links 3-56, 3-60, 3-62, 3-68, 3-70, 3-72, 3-76, 3-88, 3-92; 21.4 miles) shares the same alignment as Variation S3-C3, except for a 3.2-mile portion (Links 3-68 and 3-70) crossing Burnt River Canyon, approximately 0.6 mile west of the alignment that was addressed in the Draft EIS. This adjustment was developed in response to the comments on the Draft EIS.

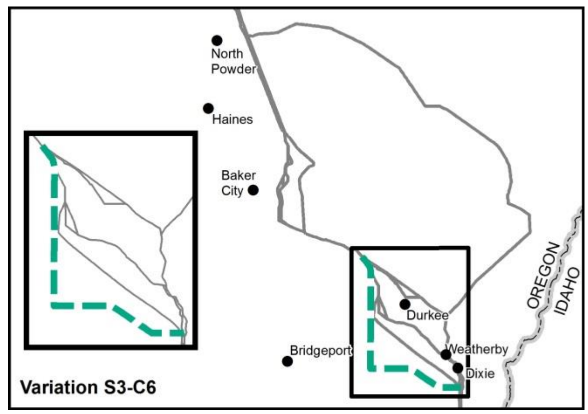




Variation S3-C5 (Links 3-56, 3-60, 3-62, 3-66, 3-71, 3-73, 3-94; 21.0 miles) begins just east of Straw Ranch Creek and north of the existing 138-kV transmission line, approximately 0.8 mile north of Interstate 84, and north of the existing 138-kV transmission line. This variation shares the same alignment as the Flagstaff B – Burnt River West Alternative. It crosses Burnt River Canyon before heading southeast for approximately 13 miles toward Weatherby Mountain, crossing the northern flank of Baldy Mountain. After traversing the southwestern flank of Weatherby Mountain the variation crosses Dixie Creek to the end of Segment 3 approximately 0.5 mile west of Interstate 84.

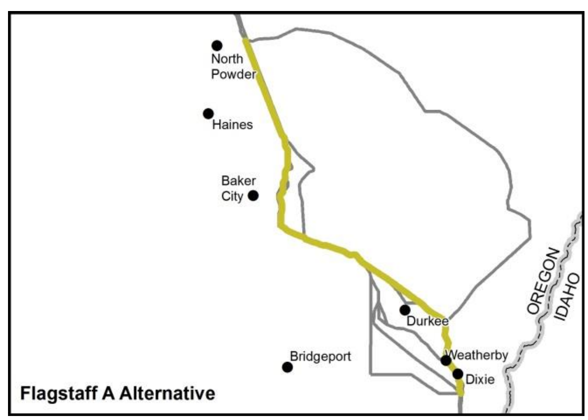
Variation S3-C6 (Links 3-56, 3-60, 3-74, 3-90, 3-94; 24.7 miles) shares the same alignment as Flagstaff B – Durkee Alternative in the Durkee area. This alignment is new based on comments on the Draft EIS received from Baker County and is intended to avoid more private and agricultural lands. As the route travels to the south, it crosses Burnt River Canyon before turning east on the northeast flank of Pedro Mountain crossing Dixie Creek twice, and the Snake River Mormon Basin Backcountry Byway, to the end of Segment 3 at Dixie Creek approximately 0.5 mile west of Interstate 84.





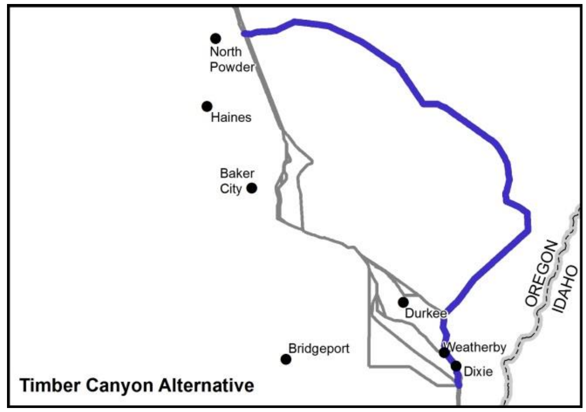
FLAGSTAFF A ALTERNATIVE [LINKS 3-4, 3-22, 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92; 55.3 MILES]

The Flagstaff A Alternative was addressed in the Draft EIS as the Flagstaff Alternative and was developed to parallel the existing 230-kV transmission line and avoid the Greater Sage-Grouse PHMA in the area east of Baker City.



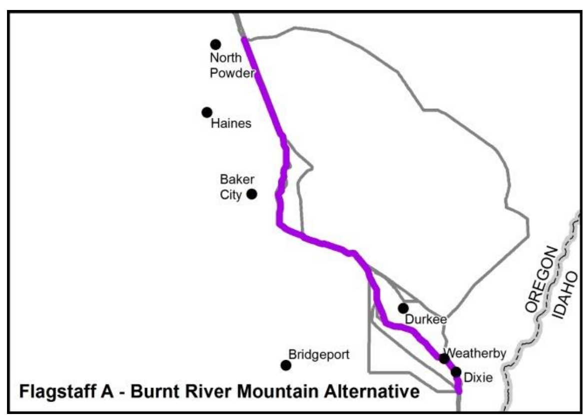
The Flagstaff A Alternative begins on Riverdale Hill colocated to closely parallel an existing 230-kV transmission line, where possible, to the southeast passing to the east of Magpie Peak and turning south near Oregon Route 203. The route continues to be colocated to closely parallel the existing 230-kV transmission line, where possible, west of Flagstaff Hill and the NHOTIC. In this area, the transmission line would be located 3 miles east of Baker City continuing to the south toward Interstate 84 passing on the west side of Lone Pine Mountain. This alternative route roughly parallels the interstate on the north side for 31 miles except near the community of Durkee and Gold Hill. In this area, the Flagstaff Alternative is located 1.5 miles to the northeast of Interstate 84 before paralleling the interstate between the communities of Weatherby and Dixie to the end of Segment 3 at Dixie Creek.

TIMBER CANYON ALTERNATIVE [LINKS 3-1, 3-2, 3-6, 3-8, 3-80, 3-82, 3-86, 3-88, 3-92; 70.3 MILES]



The Timber Canyon Alternative was addressed in the Draft EIS and was developed to avoid effects on Greater Sage-Grouse PHMAs and Oregon NHT segments. The Timber Canyon Alternative begins on Riverdale Hill where the route heads east passing north of Thief Valley Reservoir and ascending the southern edge of Wallowa Mountains onto the Wallowa-Whitman National Forest. After crossing Oregon Route 203 north of the community of Medical Springs, this route turns to the southeast crossing Big Creek and Goose Creek before passing east of the community of Sparta to Eagle Creek. In this area, the route turns to the south staying west of the communities of New Bridge and Richland then crosses the Powder River before turning to the southwest. This alternative route travels 17 miles southwest toward the community of Weatherby passing to the west of Big Lookout Mountain and Daly Creek. The Timber Canyon Alternative does not parallel existing transmission lines except at the southern end of the route near Weatherby, the transmission line would parallel Interstate 84 for approximately 4 miles to the end of Segment 3 at Dixie Creek.

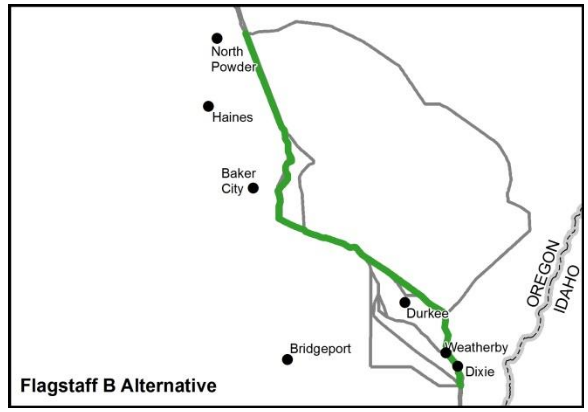
FLAGSTAFF A – BURNT RIVER MOUNTAIN ALTERNATIVE [LINKS 3-10, 3-12, 3-14, 3-20, 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48, 3-52, 3-54, 3-56, 3-60, 3-62, 3-64, 3-72, 3-76, 3-88, 3-92; 55.3 MILES]



The Burnt River Mountain portion of the Flagstaff A – Burnt River Mountain Alternative was addressed in the Draft EIS and was intended to avoid Greater Sage-Grouse PHMA and the community of Durkee.

The Flagstaff A – Burnt River Mountain Alternative begins on Riverdale Hill, colocated to closely parallel an existing 230-kV transmission line where possible, to the southeast passing to the east of Magpie Peak and then turning east of Flagstaff Hill to pass to the west of the NHOTIC and 5 miles east of Baker City. After crossing Oregon Route 86, the alternative route travels south to Interstate 84, to the east of Lone Pine Mountain, where the transmission line would roughly parallel the interstate on the north side for 28 miles except near the community of Durkee. In this area the route turns more to the south crossing Intestate 84 and then Burnt River Canyon, located 2.5 miles southeast of Durkee, before crossing Interstate 84 again near Weatherby. The alternative route then parallels the interstate for 4 miles to the end of Segment 3 at Dixie Creek.

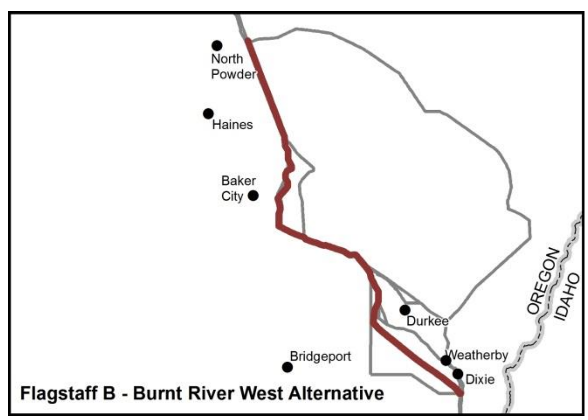
FLAGSTAFF B ALTERNATIVE [LINKS 3-4, 3-22, 3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92; 56.0 MILES]



The Flagstaff B Alternative was not addressed as such in the Draft EIS and is the result of incorporating a route-variation option recommended in comments between the Draft and Final EIS. The Flagstaff B Alternative begins on Riverdale Hill paralleling an existing 230-kV transmission line to the southeast passing to the east of Magpie Peak. Beginning 1 mile north of Oregon Route 203, the Flagstaff B Alternative follows the alignment of the Flagstaff A Alternative for approximately 0.6 mile before joining other route-variation option alignments to avoid private lands and agricultural operations recommended between the Draft and Final EIS.

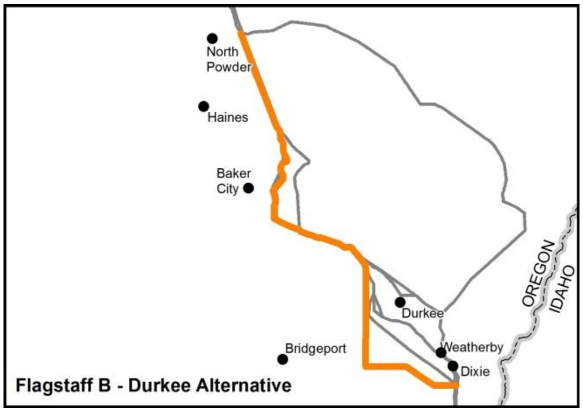
The alternative route follows the existing 230-kV transmission line for 1 mile before heading southeast into Flagstaff Gulch before turning southwest crossing Oregon Route 86 1 mile west of Flagstaff Hill. The route turns to the southwest before turning south as it closely parallels the existing 230-kV transmission line for 3 miles and then travels south to Interstate 84, where the alternative would roughly parallel the interstate on the north side for 31 miles except near the community of Durkee and Gold Hill. In this area, the alternative is located 1.5 miles to the northeast of Interstate 84 before paralleling the interstate between the communities of Weatherby and Dixie to the end of Segment 3 at Dixie Creek.

FLAGSTAFF B – BURNT RIVER WEST ALTERNATIVE [LINKS 3-10, 3-12, 3-14, 3-20, 3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48, 3-52, 3-54, 3-56, 3-60, 3-62, 3-66, 3-71, 3-73, 3-94; 55.7 MILES]



The Flagstaff B – Burnt River West Alternative was not addressed as such in the Draft EIS and is the result of incorporating route-variation options recommended in comments between the Draft and Final EIS. The Flagstaff B – Burnt River West Alternative begins on Riverdale Hill paralleling an existing 230-kV transmission line (offset approximately 250-feet to the west). Beginning 1 mile north of Oregon Route 203, the Flagstaff B Alternative follows the alignment of the Flagstaff A Alternative for approximately 0.6 mile before joining other route-variation option alignments to avoid private lands and agricultural operations recommended since the Draft EIS was released for public review. The alternative follows the existing 230-kV transmission line for 1 mile before heading southeast into Flagstaff Gulch before turning southwest crossing Oregon Route 86 1 mile west of Flagstaff Hill. The route turns to the southwest before turning south as it closely parallels the existing 230-kV transmission line for 3 miles and then travels south to Interstate 84. To the east of Straw Ranch Creek, the alternative crosses a 138-kV transmission line and Interstate 84 and follows a route-variation option recommended by Baker County. The alternative route crosses Burnt River Canyon before heading southeast for approximately 13 miles toward Weatherby Mountain, crossing the northern flank of Baldy Mountain. After traversing the southwestern flank of Weatherby Mountain the alternative route crosses Dixie Creek to the end of Segment 3 approximately 0.5 mile west of Interstate 84.

FLAGSTAFF B – DURKEE ALTERNATIVE [LINKS 3-4,3-22, 3-24, 3-31, 3-37, 3-41, 3-46, 3-45, 3-44, 3-48, 3-52, 3-54, 3-56, 3-60, 3-74, 3-90, 3-94; 59.6 MILES]

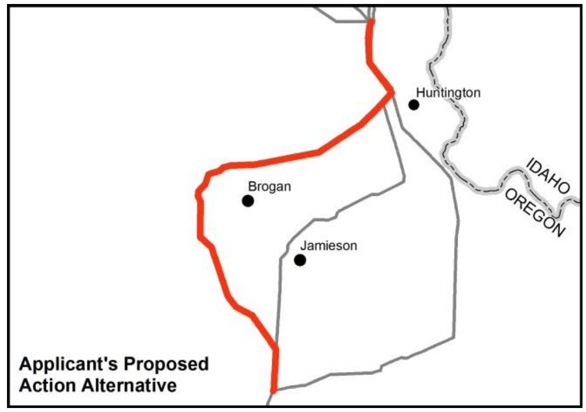


The Flagstaff B – Durkee Alternative was not addressed as such in the Draft EIS and is the result of incorporating a route-variation option recommended in comments between the Draft and Final EIS. The Flagstaff B – Durkee Alternative begins on Riverdale Hill paralleling an existing 230-kV transmission line to the south passing to the east of Magpie Peak. Beginning 1 mile north of Oregon Route 203, the Flagstaff B Alternative follows the alignment of the Flagstaff A Alternative for approximately 0.6 mile before joining a new alignment the result of route-variation options to avoid private lands and agricultural operations recommended since the Draft EIS was released for public review. The alternative follows an existing 230-kV transmission line for 1 mile before heading southeast into Flagstaff Gulch before turning southwest crossing Oregon Route 86 1 mile west of Flagstaff Hill. The route turns to the southwest before turning south as it closely parallels the existing 230-kV transmission line for 3 miles and then travels south to Interstate 84, roughly paralleling the interstate for 9 miles. To the east of Straw Ranch Creek, the alternative route crosses a 138-kV transmission line and Interstate 84 and follows a route-variation option recommended by Baker County. The alternative route travels south for 11 miles crossing Burnt River Canyon and below Sheep Mountain before turning and heading east on the northeastern flank of Pedro Mountain, crossing Dixie Creek twice, and the Snake River Mormon Basin Backcountry Byway, to the end of Segment 3 at Dixie Creek approximately 0.5 mile west of Interstate 84.

2.5.2.4 SEGMENT 4—BROGAN

Segment 4 begins at a point just south of Dixie in Baker County and ends at a point south of Jamieson in Malheur County. The three alternative routes and one area of local route variations in Segment 4 are shown on Map 2-7d.

APPLICANT'S PROPOSED ACTION ALTERNATIVE [LINKS 4-1, 4-10, 4-11, 4-13, 4-25, 4-45, 4-50, 4-65, 4-70; 40.1 MILES]

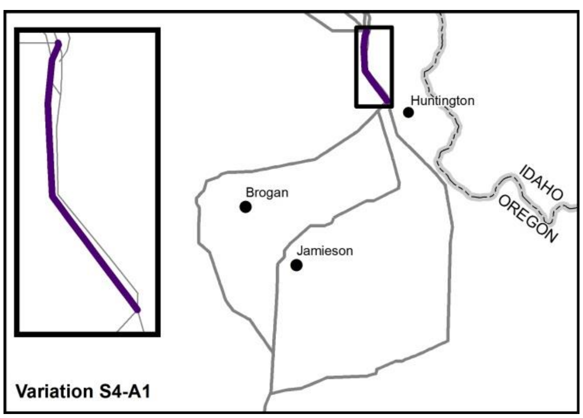


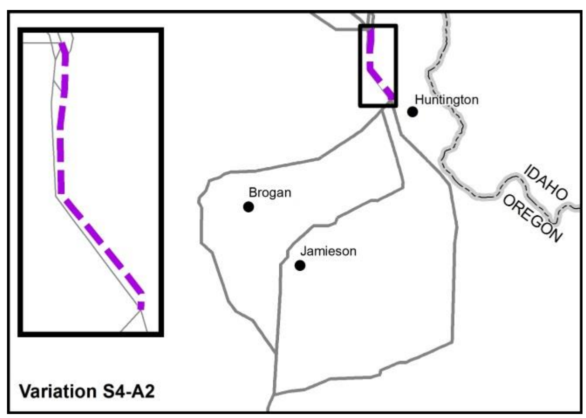
The Applicant's Proposed Action Alternative in Segment 4 was addressed in the Draft EIS and parallels an existing 138-kV transmission line to the south from Dixie Creek to Durbin Creek (west of the community of Huntington), approximately 5 miles, before turning to the southwest toward the community of Brogan. The route passes north of Lost Tom Mountain and then crosses Birch Creek and Phipps Creek east of Brogan. The transmission line would cross U.S. Highway 26, approximately 4 miles east of Brogan, where the route turns to the south running along the eastern flank of Cottonwood Mountain to the end of the Segment 4 north of Bully Creek.

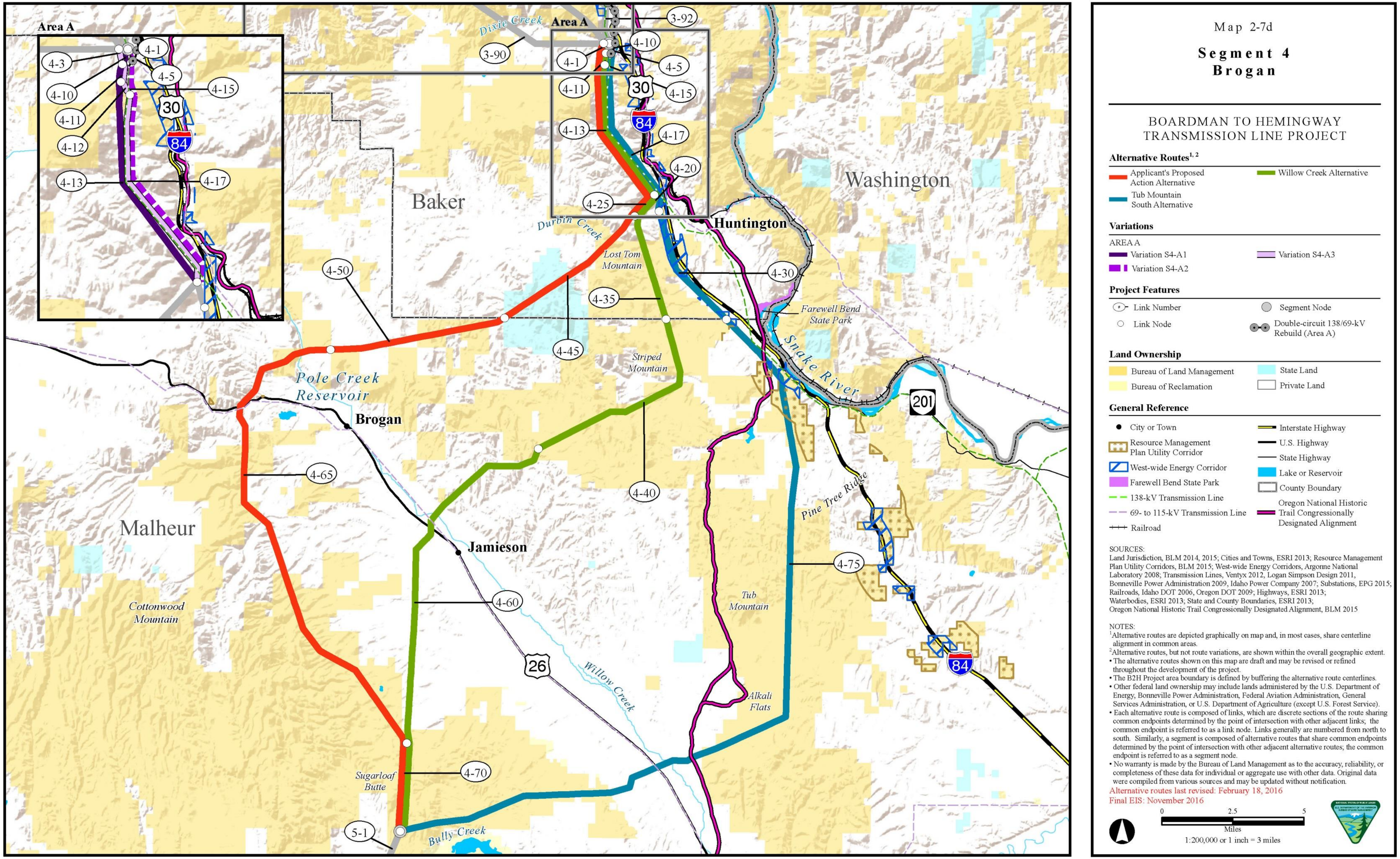
VARIATION S4 AREA A (COLOCATION NORTHWEST OF HUNTINGTON)

Variation S4-A1 (Links 4-1, 4-10, 4-11, 4-13; 5.9 miles) is the same alignment as Applicant's Proposed Action Alternative and Willow Creek Alternative paralleling an existing 138-kV transmission line from Dixie Creek to Durbin Creek (west of community of Huntington) for approximately 6 miles.

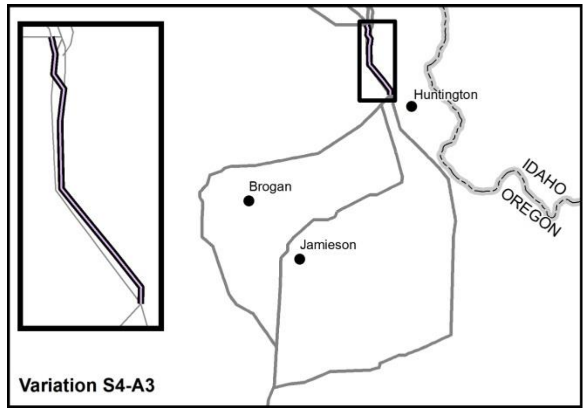
Variation S4-A2 (Links 4-1, 4-5, 4-15, 4-17; 6.0 miles) separates from the Segment 4 alternatives by more closely paralleling the existing 138-kV transmission line from Dixie Creek to Durbin Creek (west of community of Huntington) for approximately 6 miles before rejoining the Segment 4 alternative routes.



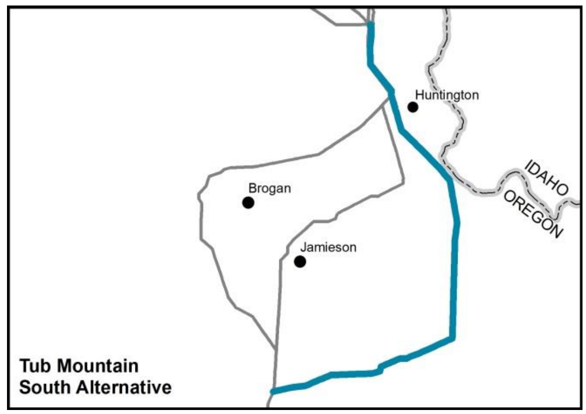



Map 2-7d
Segment 4
Brogan
BOARDMAN TO HEMINGWAY
TRANSMISSION LINE PROJECT
Alternative Routes[1, 2]
Applicant's Proposed Action Alternative
Willow Creek Alternative
Tub Mountain South Alternative
Variations
AREA A
Variation S4-A1
Variation S4-A3
Variation S4-A2
Project Features
Link Number
Segment Node
Link Node
Double-circuit 138/69-kV Rebuild (Area A)
Land Ownership
Bureau of Land Management
State Land
Bureau of Reclamation
Private Land
General Reference
City or Town
Interstate Highway
Resource Management Plan Utility Corridor
U.S. Highway
State Highway
West-wide Energy Corridor
Lake or Reservoir
Farewell Bend State Park
County Boundary
138-kV Transmission Line
69- to 115-kV Transmission Line
Oregon National Historic Trail Congressionally Designated Alignment
Railroad
SOURCES:
Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Resource Management Plan Utility Corridors, BLM 2015; West-wide Energy Corridors, Argonne National Laboratory 2008; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015
NOTES:
[1]Alternative routes are depicted graphically on map and, in most cases, share centerline alignment in common areas.
[2]Alternative routes, but not route variations, are shown within the overall geographic extent.
• The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
• The B2H Project area boundary is defined by buffering the alternative route centerlines.
• Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
• Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
• No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
Alternative routes last revised: February 18, 2016
Final EIS: November 2016
0
2.5
5
Miles
1:200,000 or 1 inch = 3 miles
Area A
4-1
4-3
4-5
4-10
4-11
4-12
4-13
4-15
4-17
3-90
3-92
4-20
4-25
4-30
4-35
4-40
4-45
4-50
4-60
4-65
4-70
4-75
5-1
30
84
26
201
Baker
Malheur
Washington
Huntington
Brogan
Jamieson
Dixie Creek
Durbin Creek
Lost Tom Mountain
Striped Mountain
Pole Creek Reservoir
Farewell Bend State Park
Snake River
Pine Tree Ridge
Cottonwood Mountain
Tub Mountain
Alkali Flats
Willow Creek
Sugarloaf Butte
Bully Creek

Variation S4-A3 (Links 4-3, 4-11, 4-12, 4-17; 6.1 miles) begins 0.2 mile west of the Applicant's Proposed Action Alternative before joining the Applicant's Proposed Action Alternative for 0.4 mile before turning southeast to closely parallel the existing 138-kV transmission line from Dixie Creek to Durbin Creek (west of community of Huntington) for approximately 5 miles before rejoining the Segment 4 alternative routes.

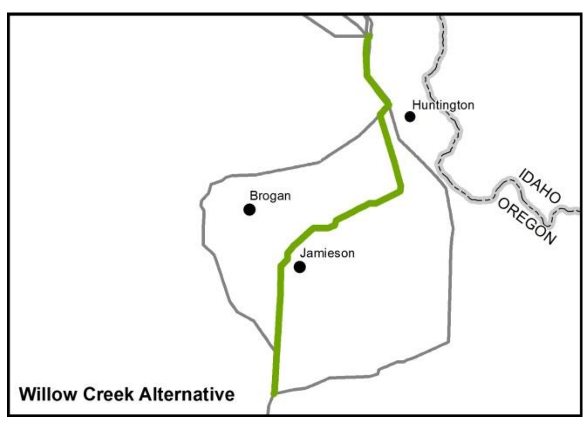


TUB MOUNTAIN SOUTH ALTERNATIVE [LINKS 4-1, 4-5, 4-15, 4-17, 4-20, 4-30, 4-75; 40.5 MILES]



The Tub Mountain South Alternative, addressed in the Draft EIS, was developed to avoid Greater Sage-Grouse habitat in the Brogan area, and was identified in the Draft EIS as the Agency Preferred Alternative. The Tub Mountain South Alternative route was colocated to closely parallel an existing 138-kV transmission line to the south from Dixie Creek to Durbin Creek (west of the community of Huntington), approximately 5 miles, before turning to the southeast toward the Snake River. Where possible (Links 4-20 and 4-21), the route is within a West-wide Energy Corridor and BLM-designated utility corridor (along the northern portion of Link 4-75). This route passes within 1 mile of Farewell Bend State Recreation Area, adjacent to an existing 138-kV transmission line, where the alternative route turns south crossing Pine Tree Ridge and along the eastern flank of Tub Mountain. On the Alkali Flats, 8 miles north of the community of Vale, this alternative turns toward the southwest crossing Willow Creek and U.S. Highway 26 to the end of Segment 4 north of Bully Creek.

WILLOW CREEK ALTERNATIVE [LINKS 4-1, 4-10, 4-11, 4-13, 4-25, 4-35, 4-40, 4-60, 4-70; 34.6 MILES]

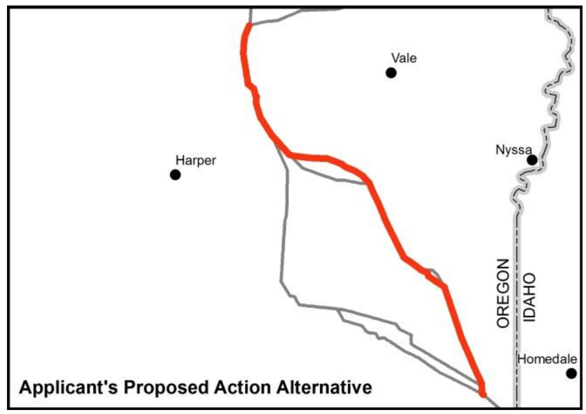


The Willow Creek Alternative, addressed in the Draft EIS, was developed to avoid Greater Sage-Grouse habitat and several known Greater Sage-Grouse leks. The Willow Creek Alternative route parallels an existing 138-kV transmission line to the south from Dixie Creek to Durbin Creek (west of the community of Huntington), approximately 5 miles, before continuing to the south toward Birch Creek. In this area, the route turns to the southwest passing south of Striped Mountain, Brosman Mountain, and McDowell Butte. Approximately 1.5 miles northwest of the community of Jamieson, at the crossing of U.S. Highway 26, the route turns to the south to pass between Sugarloaf Butte and Hope Butte to the end of Segment 4 north of Bully Creek.

2.5.2.5 Segment 5—Malheur

Segment 5 begins at a point south of Jamieson in Malheur County and ends at a point 3 miles west of the Oregon-Idaho border. The three alternative routes and two areas of local route variations in Segment 5 are shown on Map 2-7e.

Applicant's Proposed Action Alternative [Links 5-1, 5-5, 5-10, 5-15, 5-40, 5-50, 5-55, 5-65, 5-70, 5-75; 40.4 miles]

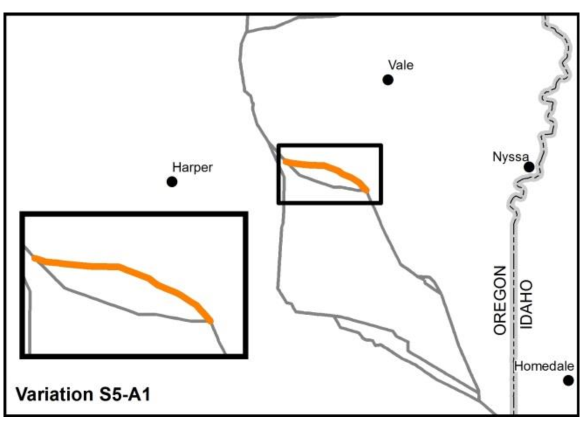


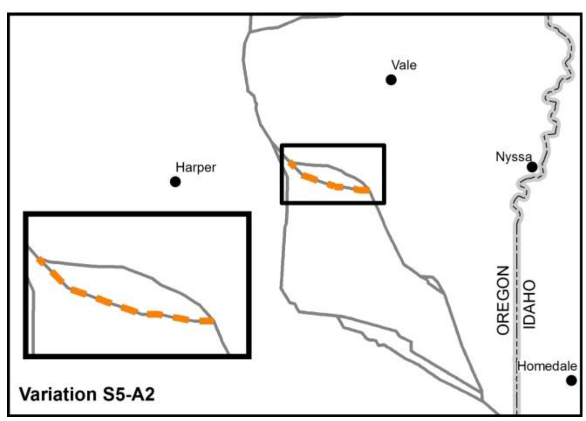
The Applicant's Proposed Action Alternative in Segment 5 was identified as the Agency Preferred Alternative in the Draft EIS. It crosses Bully Creek at the beginning of Segment 5 traveling to the south where the route crosses Malheur Canyon and U.S. Highway 20 before turning toward the east to pass around the north side of Double Mountain. The route then continues to the southeast crossing the Owyhee River in a portion of the river determined by the BLM to be suitable for designation as a National WSR. South of the Owyhee River, the transmission line would continue to the southeast to the end of Segment 5 near Succor Creek approximately 3 miles west of the Oregon-Idaho border.

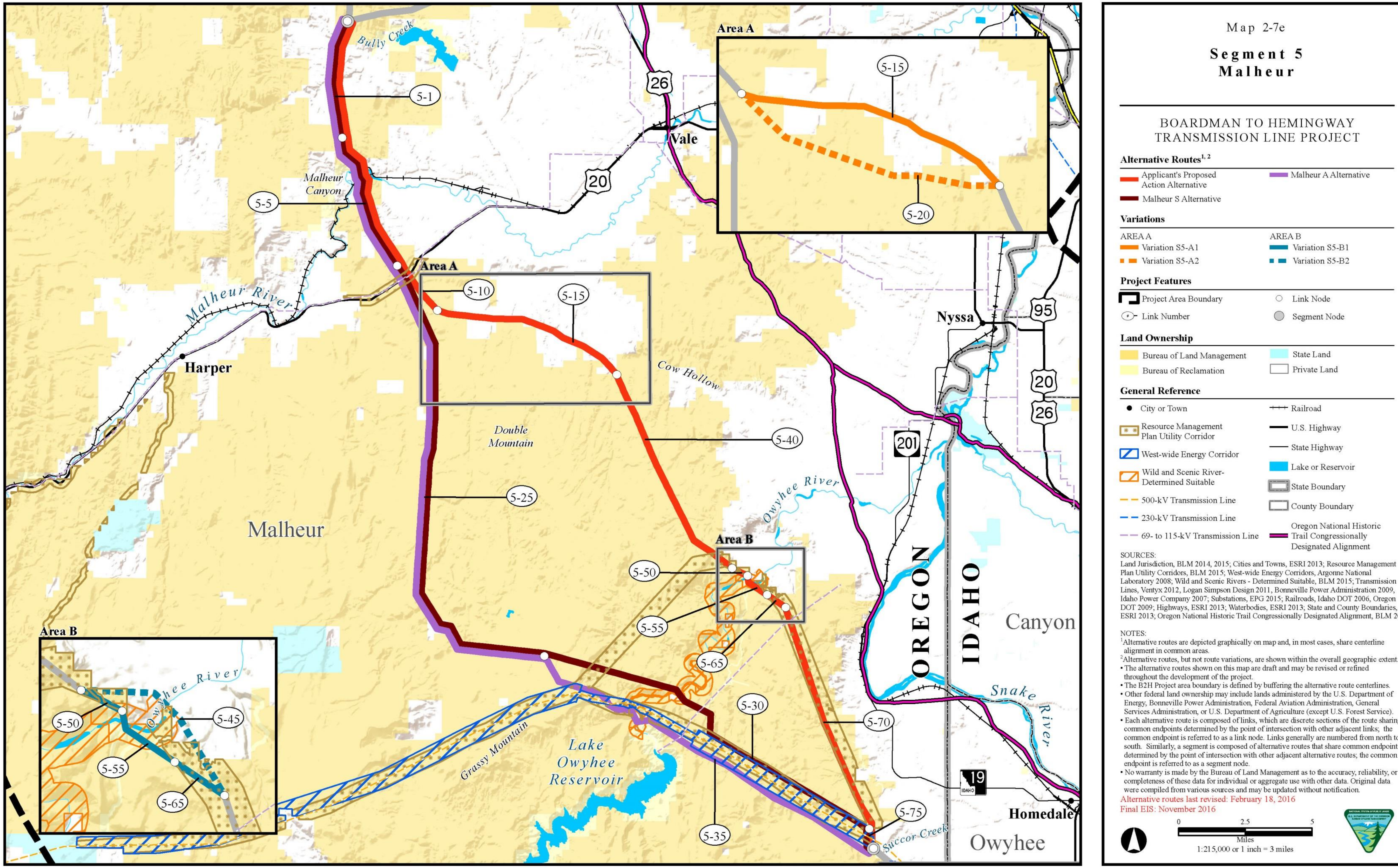
Variation S5 Area A (Double Mountain Area)

Variation S5-A1 (Link 5-15; 7.4 miles), addressed in the Draft EIS, was developed to avoid crossing lands with wilderness characteristics. Variation S5-A1 is the alignment of the Applicant's Proposed Action Alternative south of U.S. Highway 20 to Cow Hollow for a distance of approximately 7 miles.

Variation S5-A2 (Link 5-20; 7.4 miles), addressed in the Draft EIS, separates from the Applicant's Proposed Action Alternative, south of U.S. Highway 20, by being located about a mile farther to the south before rejoining the Applicant's Proposed Action Alternative in Cow Hollow. Variation S5-A2 crosses areas of lands with wilderness characteristics.






Area A
Area B
5-1
5-5
5-10
5-15
5-20
5-25
5-30
5-35
5-40
5-45
5-50
5-55
5-65
5-70
5-75
Bully Creek
Vale
Malheur Canyon
Malheur River
Harper
Cow Hollow
Double Mountain
Owyhee River
Malheur
Nyssa
OREGON
IDAHO
Canyon
Snake River
Grassy Mountain
Lake Owyhee Reservoir
Succor Creek
Homedale
Owyhee
26
20
95
201
19
Map 2-7e
Segment 5
Malheur
BOARDMAN TO HEMINGWAY
TRANSMISSION LINE PROJECT
Alternative Routes[1, 2]
Applicant's Proposed Action Alternative
Malheur A Alternative
Malheur S Alternative
Variations
AREA A
Variation S5-A1
Variation S5-A2
AREA B
Variation S5-B1
Variation S5-B2
Project Features
Project Area Boundary
Link Node
Link Number
Segment Node
Land Ownership
Bureau of Land Management
State Land
Bureau of Reclamation
Private Land
General Reference
City or Town
Railroad
Resource Management Plan Utility Corridor
U.S. Highway
State Highway
West-wide Energy Corridor
Lake or Reservoir
Wild and Scenic River-Determined Suitable
State Boundary
500-kV Transmission Line
County Boundary
230-kV Transmission Line
69- to 115-kV Transmission Line
Oregon National Historic Trail Congressionally Designated Alignment
SOURCES:
Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Resource Management Plan Utility Corridors, BLM 2015; West-wide Energy Corridors, Argonne National Laboratory 2008; Wild and Scenic Rivers - Determined Suitable, BLM 2015; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015
NOTES:
[1]Alternative routes are depicted graphically on map and, in most cases, share centerline alignment in common areas.
[2]Alternative routes, but not route variations, are shown within the overall geographic extent.
• The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
• The B2H Project area boundary is defined by buffering the alternative route centerlines.
• Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
• Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
• No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
Alternative routes last revised: February 18, 2016
Final EIS: November 2016
0
2.5
5
Miles
1:215,000 or 1 inch = 3 miles

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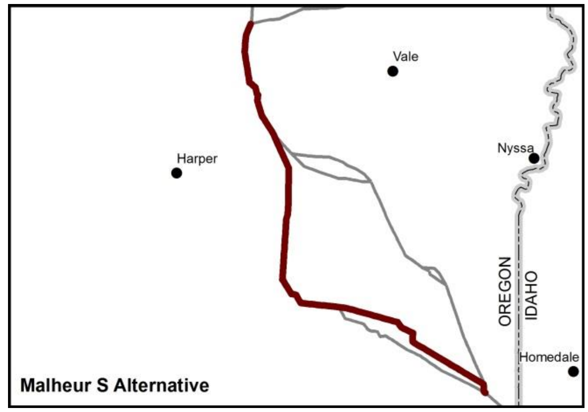
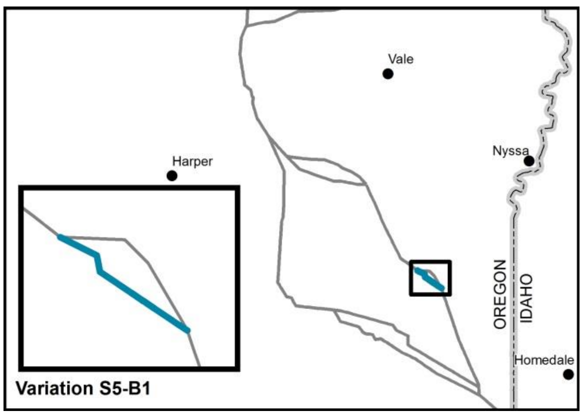
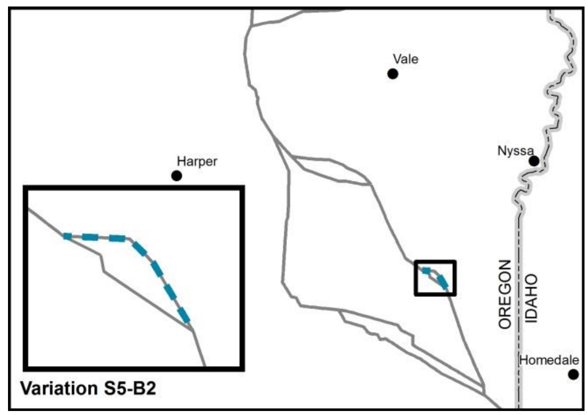
Variation S5 Area B (Owyhee River Crossing)

Variation S5-B1 (Links 5-50, 5-55, 5-56; 2.5 miles), addressed in the Draft EIS, is the alignment of the Applicant's Proposed Action Alternative across the Owyhee River in an area determined by the BLM to be suitable for designation as a National WSR for a distance of approximately 2.5 miles.



Variation S5-B2 (Link 5-45; 2.8 miles) was not addressed in the Draft EIS and is a route-variation option developed by the BLM farther to the northeast and outside the area determined to be suitable for wild and scenic designation. Variation S5-B2 separates from the Applicant's Proposed Action Alternative at the crossing of the Owyhee River.

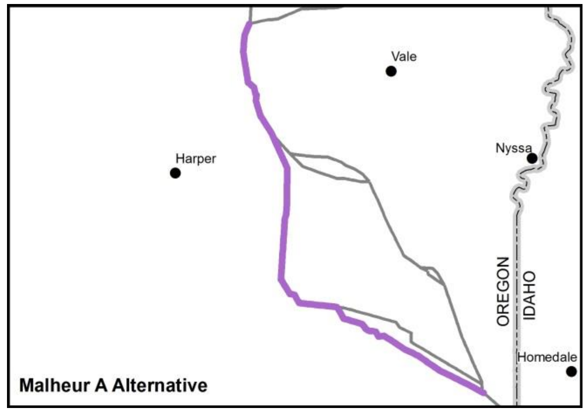




Malheur S Alternative [Links 5-1, 5-5, 5-25, 5-30, 5-75; 43.5 miles]

The Malheur S Alternative, addressed in the Draft EIS, was developed to avoid privately owned farmland and to avoid lands with wilderness characteristics. Malheur S Alternative crosses Bully Creek at the beginning of Segment 5 traveling to south where the route crosses Malheur Canyon and U.S. Highway 20 into Sand Hollow. North of Grassy Mountain, this alternative turns to the southeast to cross the Owyhee River in the Owyhee River Below the Dam Area of Critical Environmental Concern (ACEC) and a portion suitable for wild and scenic designation, north of an existing 500-kV transmission line 2.5 miles north of the Owyhee Dam. The transmission line would continue to parallel the existing 500-kV transmission line to the southeast to the end of Segment 5 near Succor Creek approximately 3 miles west of the Oregon-Idaho border.

MALHEUR A ALTERNATIVE [LINKS 5-1, 5-5, 5-25, 5-35; 43.1 MILES]

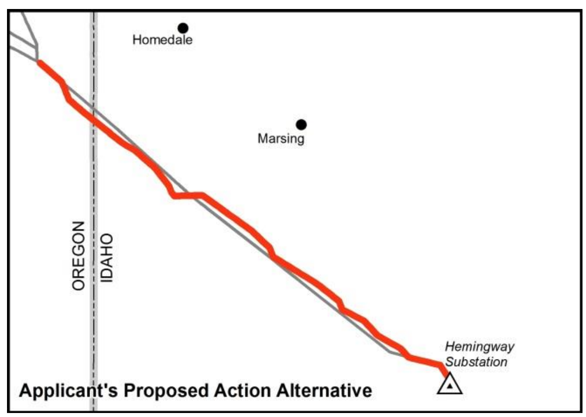


The Malheur A Alternative, addressed in the Draft EIS, was developed to be within or parallel the West-wide Energy Corridor in the vicinity of the Owyhee Dam. Malheur A Alternative crosses Bully Creek at the beginning of Segment 5 traveling to south where the route crosses Malheur Canyon and U.S. Highway 20 into Sand Hollow. North of Grassy Mountain, this alternative turns to the southeast to cross the Owyhee River, in the Owyhee River Below the Dam ACEC and a portion suitable for wild and scenic designation, south of an existing 500-kV transmission line 1.5 miles north of the Owyhee Dam. The transmission line would continue to parallel the existing 500-kV transmission line to the southeast to the end of Segment 5 near Succor Creek approximately 3 miles west of the Oregon-Idaho border.

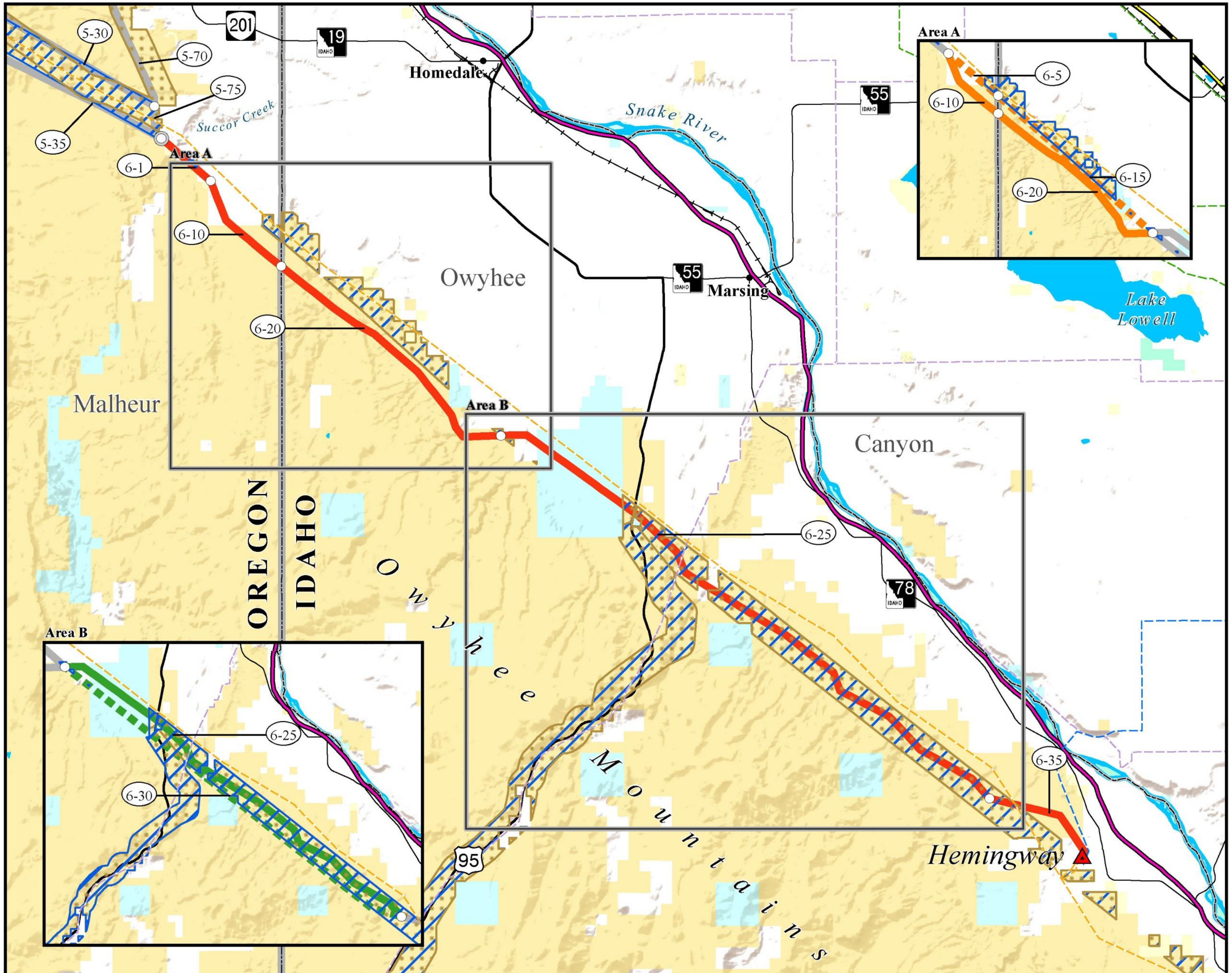
2.5.2.6 SEGMENT 6—TREASURE VALLEY

Segment 6 begins at a point approximately 3 miles west of the Oregon-Idaho border and ends at the Hemingway Substation in Owyhee County, Idaho. The one route and two areas of local route variations in Segment 6 are shown on Map 2-7f.

APPLICANT'S PROPOSED ACTION ALTERNATIVE [LINKS 6-1, 6-10, 6-20, 6-25, 6-35; 28.0 MILES]



The Applicant's Proposed Action Alternative in Segment 6, addressed in the Draft EIS, begins near Succor Creek, approximately 3 miles west of the Oregon-Idaho border, traveling to the southeast into Idaho adjacent to an existing 500-kV transmission line, along the northwestern flank of the Owyhee Mountains. This route is located northeast of Jump Creek Canyon ACEC and further to the southeast is located within a designated West-wide Energy Corridor, crossing U.S. Highway 95 and Reynolds Creek before entering the existing Hemingway Substation 7 miles west of the community of Melba, Idaho.



Map 2-7f

Segment 6
Treasure Valley

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Alternative Routes[1, 2]

Applicant's Proposed Action Alternative

Variations

AREA A
- Variation S6-A1
- Variation S6-A2

AREA B
- Variation S6-B1
- Variation S6-B2

Project Features

- Substation (Project Terminal)
- Link Number
- Link Node
- Segment Node

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- U.S. Fish and Wildlife Service
- State Land
- Private Land

General Reference

- City or Town
- Resource Management Plan Utility Corridor
- West-wide Energy Corridor
- 500-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Resource Management Plan Utility Corridors, BLM 2015; West-wide Energy Corridors, Argonne National Laboratory 2008; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
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[2]Alternative routes, but not route variations, are shown within the overall geographic extent.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:150,000 or 1 inch = 2 miles

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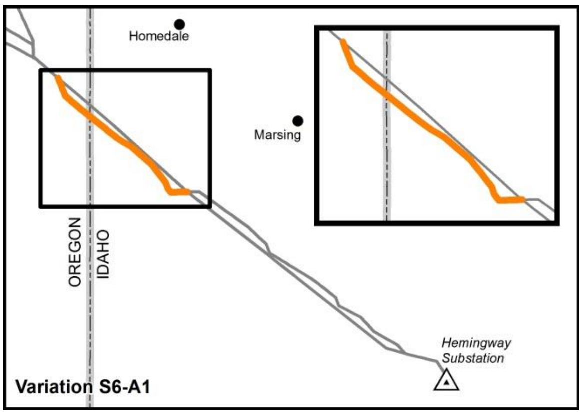
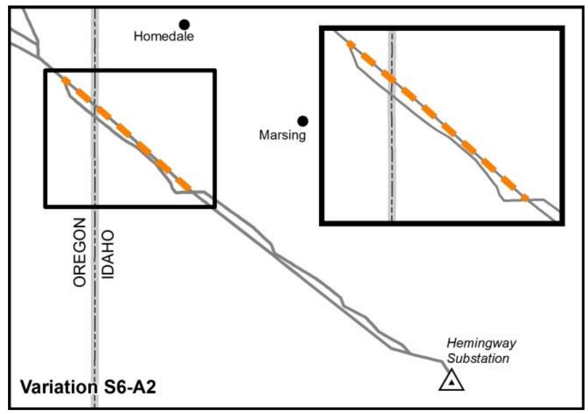
Variation S6 Area A

The BLM developed the variations as part of colocating the proposed transmission line to existing transmission lines in the area and to use the utility corridor designated on BLM-administered land more efficiently.

Variation S6-A1 (Links 6-10, 6-20; 9.3 miles) is the alignment of the Applicant's Proposed Action Alternative from Succor Creek, crossing the Oregon-Idaho border, to Jump Creek for a total distance of 9 miles in proximity to the existing 500-kV transmission line.

Variation S6-A2 (Links 6-5, 6-15; 8.9 miles) was developed between the Draft and Final EIS by the BLM.. Variation S6-A2 separates from the Applicant's Proposed Action Alternative at Succor Creek, to more closely parallel the existing 500-kV transmission line and to be located within the designated West-wide Energy Corridor to Jump Creek.

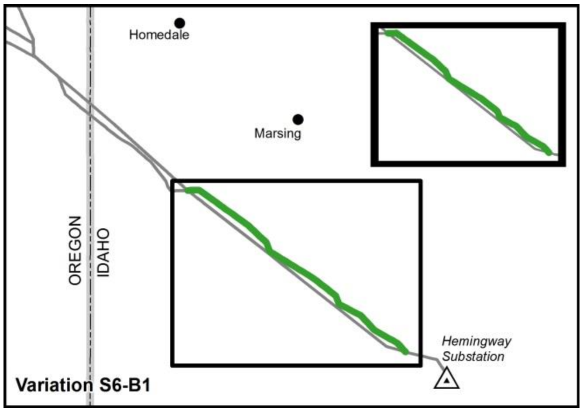


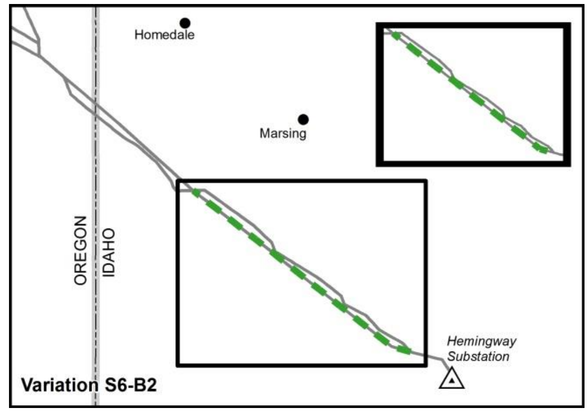


Variation S6 Area B

Variation S6-B1 (Link 6-25; 14.4 miles) is the alignment of the Applicant's Proposed Action Alternative from Jump Creek to Wilson Creek, 2.5 miles northwest of the existing Hemingway Substation, for a total distance of 14 miles. This route more closely parallels the existing 500-kV transmission line in the designated West-wide Energy Corridor.

Variation S6-B2 (Link 6-30; 14.1 miles) was developed between the Draft and Final EIS by the BLM. Variation S6-B2 separates from the Applicant's Proposed Action Alternative at Jump Creek and crosses in proximity to the Jump Creek Canyon ACEC than Variation S6-B1 traveling to the southeast for 14 miles to Wilson Creek, 2.5 miles northwest of the existing Hemingway Substation. This route is not located as close to the existing 500-kV transmission line as Variation S6-B1 since it is located along the southwest edge of the West-wide Energy Corridor to allow for future linear utilities to be sited between the proposed and the existing transmission lines.





2.5.3 No Action Alternative

The Council on Environmental Quality regulations require that EISs describe a "no action" alternative to a proposed action (40 CFR 1502.14(d)). The No Action Alternative describes the reasonably foreseeable outcome that would result from denying the Applicant's requests for a right-of-way grant and special- use authorization to construct the proposed B2H Project. If no action is taken, the BLM would not grant a right-of-way and the USFS would not authorize a special-use permit for the B2H Project to cross federal lands and the transmission line and ancillary facilities would not be constructed on federal lands. Additionally, the objectives of the signatories to the 2009 Memorandum of Understanding to accommodate additional electrical generation capacity, improve reliability, and reduce congestion by expanding and modernizing the transmission grid through the B2H Project would not be met. The Applicant's objectives for the B2H Project, which include providing additional capacity to connect the Pacific Northwest Region with the Intermountain region of southern Idaho to alleviate existing transmission constraints between the two areas and to ensure sufficient capacity so that Idaho Power can meet present and forecasted load requirements (as described in Section 1.4, Idaho Power's Objectives for the B2H Project), would not be met.

The No Action Alternative is intended to describe the existing and future state of the environment in the absence of the Proposed Action. It provides a baseline for comparing environmental effects and demonstrates the consequences of not granting the right-of-way and authorizing special use.